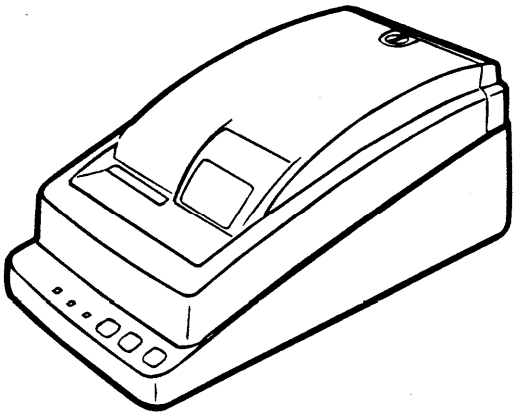
ER-01PU

SHARP SERVICE MANUAL

CODE: 00ZER01PUSM2E



ECR / POS OPTION
THERMAL LINE PRINTER

MODEL ER-01PU

PRINTER : PR-58L

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PARTS GUIDE (Except for "KA" version)
PARTS GUIDE (For "KA" version)

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

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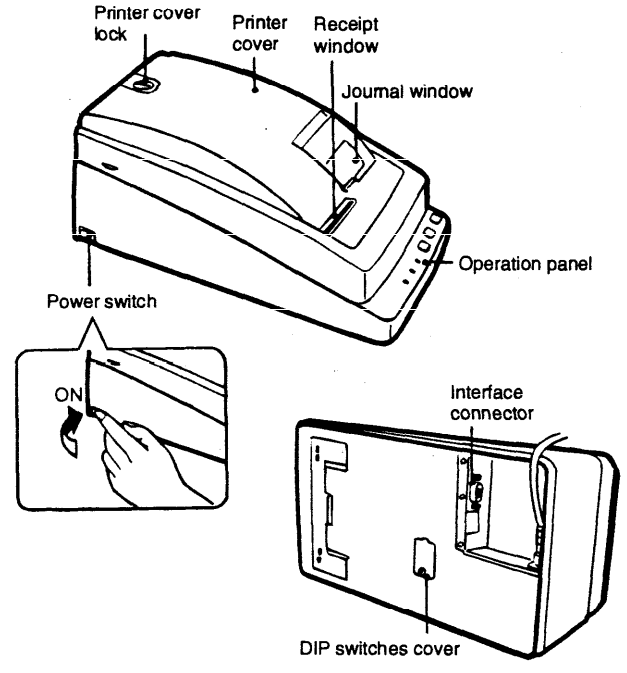
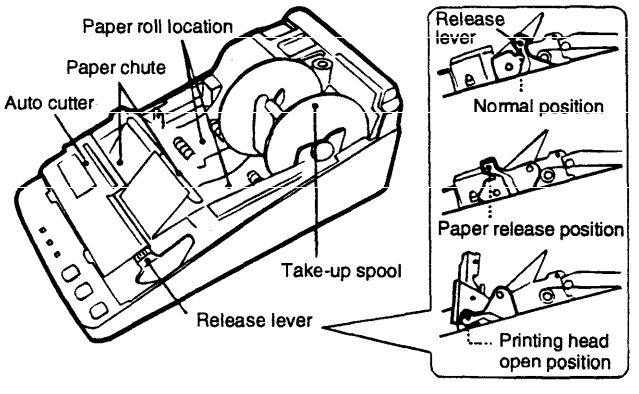
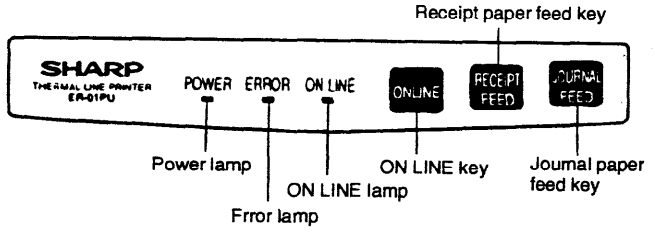
CHAPTER 1. SPECIFICATIONS

1. Appearance/Rating

1) Appearance







2) Rating

Power	VAC 50/60Hz
Demand	Stand-by: 9W Printing: 89W
Ambient temperature/humidity	0-40°C 10-90%
Outside dimension	178 (W) x 340 (D) x 153 (H)
Weight	4.2kg

2. Journal lock (Printer cover lock)

- Method of locking
  Locking: Rotating clockwise 90°
  Unlocking: Rotating counterclockwise 90°
- Key No.: SK224

3. Power switch

The power switch (seesaw switch) provided on the lower portion of the left side of the main unit is used to turn ON/OFF the power supplied to the printer.

4. Panel switch

The three panel switches provided on the upper portion of the front of the main unit have the functions shown below.

ON-LINE	Used to switches ON-LINE/OFF-LINE (toggle switch).
RECEIPT FEED	Used to perform manual paper feed on the receipt side. Paper feeding is continued while it is ON.
JOURNAL FEED	Used to perform manual paper feed on the journal side. Paper feeding is continued while it is ON.

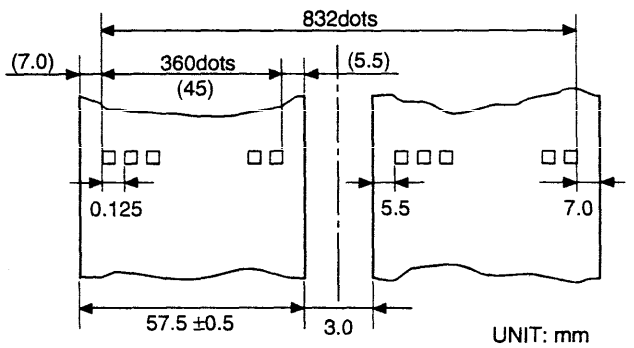
5. Panel LED

The three panel LEDs provided (together with panel switches) on the upper portion of the front of the main unit have the functions shown below.

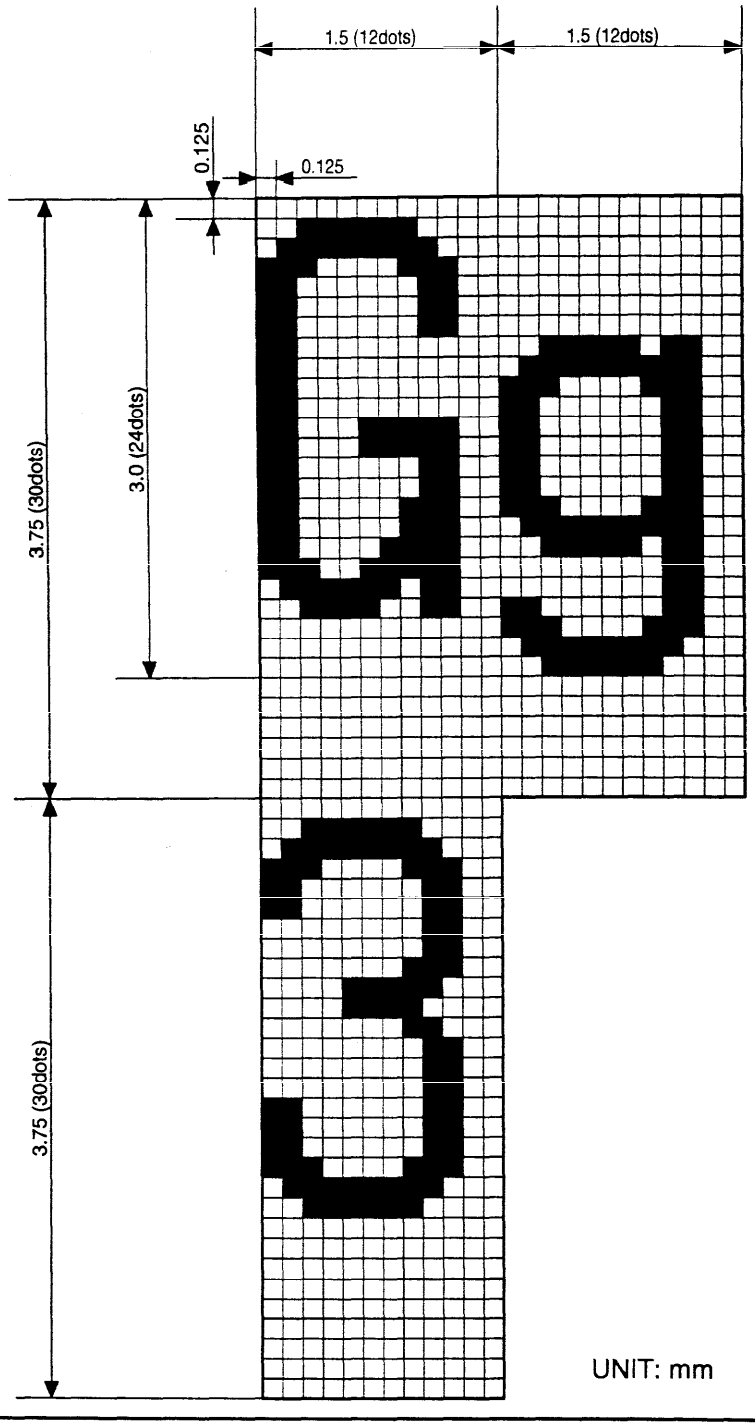
POWER LED	Green	
	Lighting:	Indicating that the power is supplied.
	Not lighting:	Indicating that the power is not supplied.
ON-LINE LED	Green	
	Lighting:	Indicating that the ON LINE is selected.
	Not lighting:	Indicating that the OFF LINE is selected.
ERROR LED	Red	
	Lighting:	Indicating that an error is caused.
	Not lighting:	Indicating that normal operation is made.

6. Receipt / Journal printer: PR-58L

1) Printer

Item	Description	
No. of station	2: Receipt and Journal	
Validation	No	
Printing system	Line thermal	
No. of dot	Receipt:	360 dots
	Journal	360 dots
Dot pitch	Horizontal:	0.125 mm
	Vertical:	0.125 mm
Font	Font A:	12 dot (W) × 24 dot (H)
	Font B:	9 dot (W) × 24 dot (H)
Printing capacity	Font A:	30 digits/line
	Font B:	40 digits/line
Character size	Font A:	1.5 mm × 3 mm
	Font B:	1.13 mm × 3 mm
Print pitch	Column distance:	1.5 mm
	Row distance:	3.75 mm
Paper feed speed	Approximate 50 mm/s	
Reliability	Mechanism:	MCBF 5 million lines
Paper end sensor	Yes (Receipt and Journal)	
Cutter	PR-58L:	Auto
Paper near end sensor	No	
Printing area		

Item	Description
Printing format	12 × 24 font



2) Auto cutter section

Item	Description
Cut method	• Full cut (Cut except 1 point) • Partial cut (Cut except 3 points)
Cuttable paper thickness	Heat sensitive paper: 60 – 80 µmm
Cuttable paper width	57.5 ±0.5 mm
Reliability	MCBF 300,000 cut

7. Printer interface

1) Interface specifications

Interface	RS232
Synchronizing mode	Asynchronous
Handshake *	DTR/DSR signal control or XON/XOFF control
Baud rate *	2400/4800/9600/19200/38400
Bit length *	7 bits/8 bits
Parity check *	Even number/Odd number/No
Stop bit	1 stop bit
Connector	D-SUB 9 pin connector

* Handshake, Baud rate, Bit length and Parity check are set with the dip switch.

2) Handshake

A) DTR/DSR control

Handshaking is performed using the DSR signal and DTR signal.

DSR signal : Indicating whether the host computer is ready to receive data or not.

ON	The host computer is ready to receive data.
OFF	The host computer is not ready to receive data.

DTR signal: Indicating whether the printer is in busy condition or not.

ON	The printer is not in busy condition.
OFF	The printer is in busy condition.

B) XON/XOFF control

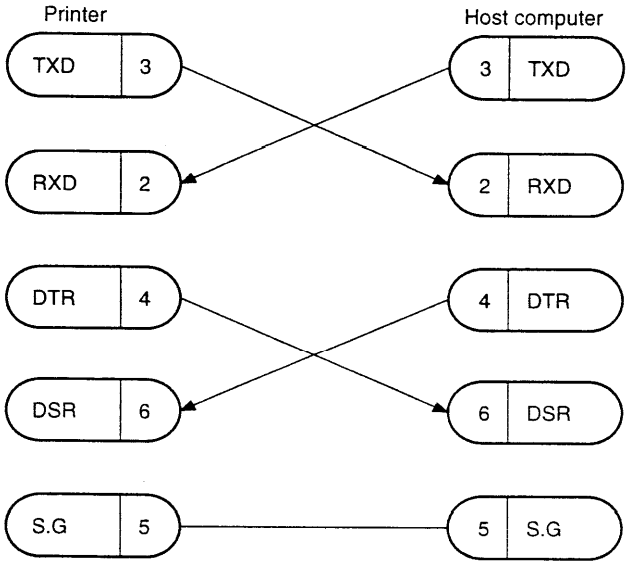
Handshaking is performed using the XON and XOFF characters.

XON	Transmitted when the printer returns from busy condition.
XOFF	Transmitted when the printer gets into busy condition.

In the following cases, the printer is in busy condition.

BUSY CONDITIONS	TIMING OF DTR OFF OR XOFF TRANSMISSION	TIMING OF DTR ON OR XON TRANSMISSION
Period between the time when the power is turned ON and the time when it becomes possible to communicate	----------	When it becomes possible to communicate
OFF-LINE key entry	Immediately before OFF-LINE	Immediately before ON-LINE
Print stop due to no paper	Immediately before print stop	Immediately after recovery from no paper
HEAD UP	Immediately before HEAD UP	Immediately after recovery from HEAD UP
Switch wait when executing the macro	Immediately before switch wait	Immediately after recovery from switch wait
Receive buffer full	When available space becomes 16 bytes or less	When available space becomes 26 bytes

3) Example of interface connection



The pin Nos. of the host computer side are those for 9-pin D-SUB.

4) Signal description

Signal name	Description
S. G	Signal ground
TXD	Transmission data
RXD	Receive data
DSR	In case of DTR/DSR control Indicates whether the host computer is ready to receive data or not. When the DSR signal is ON, the host computer is ready to receive data. When the DSR signal is OFF, the host computer is not ready to receive data. In case of XON/XOFF control Does not control the printer.
DRT	In case of DTR/DSR control Indicates whether the printer is in busy condition or not. When the DTR signal is ON, the printer is in normal condition. When the DTR signal is OFF, the host computer is in busy condition. In case of XON/XOFF control Does not control the printer.

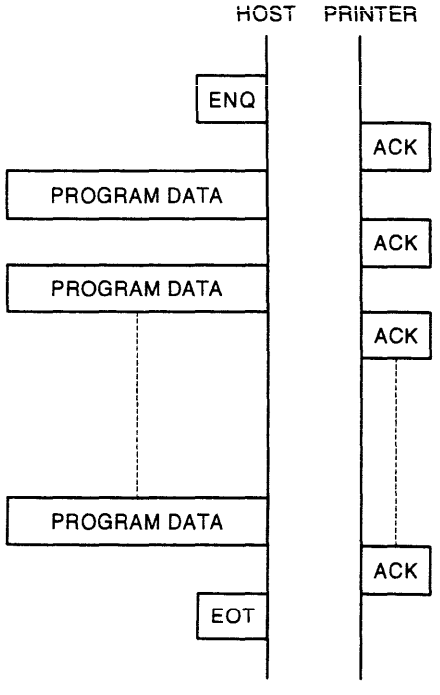
8. IPL interface

1) Interface specifications

Asynchronous mode	
1 STOP bit	
Handshake	Poling (simplified procedure) fixed
Bit length	8 bits fixed
Parity check	Performed/Not performed (selected with DIP SW)
Parity selection	Even number/Odd number/No (selected with DIP SW)
Baud rate selection	2400/4800/9600/19200/38400 (selected with DIP SW)

2) Handshake : Simplified procedure

Protocol:



When receiving program data, the printer checks the checksum. If no error is found, the printer returns ACK. If any error is found, the printer returns NAK.

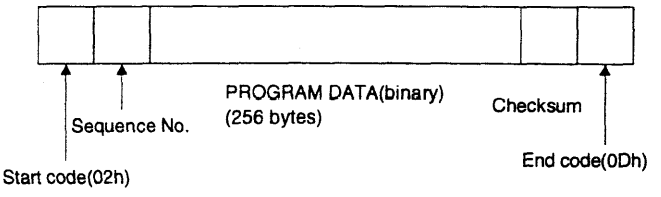
If the host computer resends the data in spite of the printer returning ACK, the printer ignores the data and returns ACK again.

(Whether to resend the data be not is judged based on the sequence NO. in the program data packet.)

The time-out period is 10 seconds .

3) DATA FORMAT:

1. ENQ : 05h 2. ACK : 06h
3. NAK : 15h 4. EOT : 04h
5. PROGRAM DATA



Sequence NO.	1 BYTES 30h---39h ring counter
Checksum	Lower 8-bit data of two's complement of sum of 1 BYTES PROGRAM DATA
PROGRAM DATA	Binary 256 BYTE fixed DATA

9. Dip switch

1) Table 1. Switch 1

Switch No.	Function	ON	OFF
1	Handshake	XON/XOFF	TDR/DSR
2	Bit length	7 bits	8 bits
3	Parity check	Performed	Not performed
4	Parity selection	Even number	Odd number
5	Criteria for BUSY condition	Receive BUFFER FULL	Receive BUFFER FULL and OFF-LINE
6	Baud rate selection (See Table 2.)		
7			
8			

2) Table 2. Baud Rate

Baud rate [BPS]	Switch No.		
	6	7	8
2400	ON	OFF	OFF
4800	OFF	ON	ON
9600	OFF	ON	OFF
19200	OFF	OFF	ON
38400	OFF	OFF	OFF

3) Table 3. Switch 2

Switch No.	Function	ON	OFF
1	MODE selection	IPL MODE *	Normal MODE
2	In case of data reception errors	Ignored	Prints "?"
3	In case of data reception errors connect to the host	Connect	Not connect
4	Print density selection (See Table 4.)		
5			
6			
7	Print speed (See Table 5.)		
8			

* For normal use, do not turn on the IPL mode.

4) Table 4. Print density selection

Print density	Switch No.		
	4	5	6
Light	ON	ON	ON
↑	ON	ON	OFF
	ON	OFF	ON
	OFF	OFF	OFF
	ON	OFF	OFF
	OFF	ON	ON
↓	OFF	ON	OFF
Dark	OFF	OFF	OFF

5) Table 5. Print speed selection

Print speed	Switch No.	
	7	8
50 mm/s	OFF	ON
60 mm/s	ON	OFF
70 mm/s	OFF	OFF

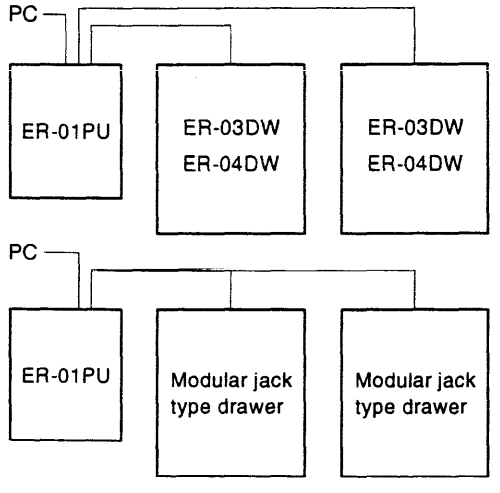
10. Drawer interface

1) General Description

As service route options of ER-01PU, two drawers made by Sharp (Remote drawer: ER-03DW/04DW) or two modular jack type drawers (made by EPSON) can be connected.

It is necessary to attach the connectors specified as service parts to the ER-01PU side. (For the service parts, refer to the section of drawer connector shown below.)

Example of Sharp drawer connectionExample of modular jack type drawer connection



2) Drawer connector

Pin arrangement (Sharp drawer connector × 2)

Pin No.	Signal name	Direction
1	Drawer drive signal	Output
2	Drawer open/close signal	Input
3	+24 V	—

Connector model No.

* Printer side 5046-03A (MOLEX)
Parts code QCNCM5278NCZZ2
Drawer side Attached to ER-03DW/04DW drawer

Pin arrangement
(Modular jack type connector × 1)

Pin No.	Signal name	Direction
1	Frame GND	—
2	Drawer drive signal 1	Output
3	Drawer open/close signal	Input
4	+24 V	—
5	Drawer drive signal 2	Output
6	Signal GND	—

Connector model No.

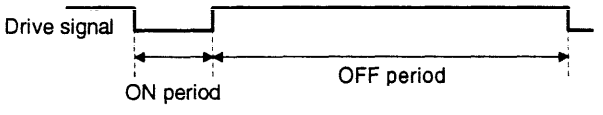
* Printer side 52065-6615 (MOLEX) or its equivalent
Drawer side 6-pole 6-pin (RJ12 modular jack)

* It is necessary to obtain the printer side connectors.

3) Drawer Interface Specifications

Drawer drive signal

Output voltage: +24V +5V
Output (peak) current: 1A or less
ON period: 40 msec – 50 msec
OFF period: 500 msec or more



Cautions

* Only one drawer can be opened at one time.
* To prevent heating, the same drawer must not be opened successively.
* When connecting drawers other than ER-03DW/04DW, the drawer solenoid resistance must be 24 Ω or more and the ON period must be in compliance with the drawer specifications (to prevent overcurrent).
* When connecting drawers other than ER-03DW/04DW, the drawer connecting cable used must be of the shield type.

11. Buzzer / Memory / Back up

1) Buzzer

The buzzer is installed on the control substrate.

It informs the user of errors caused during processing. (The type of error is judged by short sound/long sound, etc.)

2) Memory Backup

The electrical double layer condenser is used for memory backup of the static RAM.

As it is intended to perform memory protection when momentary power failure is caused, it can not protect memory for a long time.

Memory maintaining time: About 3 hours after power supply OFF (in case of full charge)

Memory charging time: From power supply ON (after discharging for 3 hours or more) to full charge: About 30 minutes

Cautions

* When the power supply becomes ON after a long time (6 hours or more) has passed, the system should be booted by means of master reset of ER-01PU.
  This is necessary because the memory maintaining time is exceeded. By transferring the initial data from the host computer to ER-01PU by means of master reset, it becomes possible to perform operation even if memory maintaining is impossible.
* As charging is performed when the power supply becomes ON after a long time, turning ON/OFF of the power of ER-01PU should be avoided. (Note that there are cases where memory cannot be maintained due to insufficient charging.)

12. Near-end sensor

1) General Description

The optional near-end sensors for journal and receipt are available.

ER-01PU has the connectors for journal and receipt near-end sensors on the control substrate. Therefore, each optional near-end sensor unit can be obtained and attached to ER-01PU.

2) Unit name

Near-end sensor: DUNT-5800BHZZ

3) Detecting method

Rolled paper diameter detecting type

CHAPTER 2. OPTIONS

1. Service options

No.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	NEAR END SENSOR	DUNT-5800BHZZ	AZ	
2	DRAWER CONNECTOR	QCNCM5278NCZZ	AC	

2. Supplies

No.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	ROLL PAPER	TPAPR6656RC05	BA	

3. Special service tools

No.	NAME	PARTS CODE
1	MASTER ROM	VHi27040RAY1A
2	SOFTWARE FOR SERVICE	UKŌG-6723RCZZ

1. Master ROM

This is the EP-RPM used to write the ER-01PU software into the flash memory.

It is used when replacing the flash ROM in repair.

For the operating procedures, refer to "CHAPTER 11. IPL MODE."

2. Software for service

The following software is provided in FD.

1) [01PUDIAG.EXE]
   This software is used to execute the diagnostics of the ER-01PU through RS232 by the remote operation from PC.
   For the operating procedures, refer to "CHAPTER 11. IPL MODE."
2) [IPL.EXE]
   This software is used to write the ER-01PU application program [ER01PU.S] from PC into the flash memory of the ER-01PU.
   For the operating procedures, refer to "CHAPTER 11. IPL MODE."
3) [ER01PU.S]
   This is an application program which is written into the ER-01PU by the use of [IPL.EXE].
   For the operating procedures, refer to "CHAPTER 11. IPL MODE."

CHAPTER 3. INITIAL PROCESSING

The following five modes are available when turning ON the power (performing initial processing).

Mode	Key sequence	Operation
MASTER RESET mode	Turn ON the power while pressing the R/J key.	The printer clears the preset data/receive buffer and starts operating.
IPL mode	For details, see the CHAPTER 11, IPL FUNCTION.	
RESUMPTION mode	Turn ON the power.	The printer resumes the printing interrupted by power failure.
DIAG mode	Turn ON the power while pressing the J key.	The printer performs the DIAG operation.
HEXADECIMAL DUMP mode	Turn ON the power while pressing the R key.	The printer prints the data sent from the host computer, using hexadecimal digits and characters corresponding to them.

1. MASTER RESET mode

Print: The DIP switch settings are printed.

```
1234567890123456789012345678901234567890
***MASTER RESET
BPS                 19200BPS      2400BPS/4800BPS/9600BPS/
                                  19200BPS/38400BPS
BIT FORMAT              8BIT      8BIT/7BIT
PARITY                  ODD       EVEN/ODD/NONE
HANDSHAKING             XON/XOFF  DTR/DSR
BUSY CONDITION          BUFFER FULL  OFF LINE
PRINT DENSITY           LEVEL1    LEVEL 1-4
PRINT SPEED             50mm/S    50, 60, 70 mm/S
VERSION No.             1A        ROM Version
```

Full cut

Display: The ONLINE lamp is turned ON when the printer sets ready to receive data from the host computer.

2. IPL mode

For details, see the CHAPTER 11. IPL FUNCTION.

3. RESUMPTION mode

Print: The printer resumes the printing interrupted by a power failure.
When a power failure occurs during printing, performs power failure mark "== = = =" and executes the printing again.
The power failure mark can be set in the [ESC] sequence.

Display: The ONLINE lamp is turned ON when the printer gets ready to receive data from the host computer.

4. DIAG mode

For details, see the CHAPTER 10. DIAG FUNCTION.

5. HEXADECIMAL mode

Print:

```
12345678901234567890123456789012345678901234567890
Hexadecimal Dump
```

For details, see the CHAPTER 6. HEXADECIMAL DUMP FUNCTION.

CHAPTER 4. COMMAND DESCRIPTION

1. Command table

No.	Command	Function	Remarks
1	[LF]	Causes print and line feed.	
2	[FF]	Causes page-mode print and return to standard mode.	Valid for page-mode print. This command causes the printer to start printing.
3	[RS]	Causes journal tabulation.	Moves the print position to the beginning of journal. (Valid only when the printing of the same data on receipt/journal has been canceled.)
4	[CAN]	Cancels print data. In the standard mode, one line of data in the receive buffer is cleared. In the page mode, all the print data is canceled.	In the page mode, all the data in the receive buffer is cleared. In the standard mode, one line of data with no print command is cleared (for recovery from power failure).
5	[SI]	Selects character height reduction.	Valid only at the beginning of a line.
6	[DC2]	Cancel character height reduction	Valid only at the beginning of a line.
7	[DLE] [EOT] [n]	Transmits status in real time.	Transmits regardless of the state of the host computer.
8	[DLE] [ENQ] [n]	Requests the printer in real time.	Transmits regardless of the state of the host computer.
9	[ESC] [FF]	Causes page-mode data print. All the data expanded to the whole print area is printed in the page mode.	Valid for page-mode. This command causes the printer to start printing. The page mode is maintained after printing.
10	[ESC] [SP] [n]	Sets character right-side spacing.	If double-width mode is selected, the amount of space is doubled. Space is provided on the right side of each character even in case of lateral turning.
11	[ESC] ! [n]	Sets character mode. Font, height and width are set.	If there are characters of different modes in one line, they are printed with their bases aligned. "AAAAA"
12	[ESC] $ [n1] [n2]	Sets absolute print starting position.	
13	[ESC] % [n]	Selects/cancels user-defined character.	The preset user-defined character is called.
14	[ESC] & [03] [n] [m] [a[p]sxa] m-n+1	Defines user-defined character.	
15	[ESC] * [m] [n1] [n2] {[data]}k	Sets bit image data.	This image shows the same movement as a normal character (it can be printed using LF). The setting is possible during printing.
16	[ESC] -[n]	Selects/cancels underline.	
17	[ESC] 2	Selects 30/203 inch (30 dot) line feed.	Valid even during printing.
18	[ESC] 3 [n]	Sets line feed amount.	Valid even during printing.
19	[ESC] 4 [n] [data] 45xn	Sets logo stamp.	
20	—	—	(Reserved)
21	[ESC] = [n]	Sets peripheral device.	
22	[ESC] ? [n]	Deletes user-defined character.	The same pattern as the internal character is printed after deletion.
23	[ESC] @	Initializes printer.	
24	[ESC] J [n]	Prints and feeds paper.	
25	[ESC] L	Switches from standard to page-mode.	Valid only at the beginning of a line.
26	[ESC] N	Turns buzzer ON.	
27	[ESC] O	Turns buzzer OF.	
28	[ESC] NAK [n]	Turns buzzer ON and OFF for a certain period of time.	
29	[ESC] R [n]	Selects international character.	
30	[ESC] S	Switches from page to standard mode.	Valid only at the beginning of a line.
31	[ESC] V [n]	Sets/cancels 90° clockwise rotated character.	
32	[ESC] \ [n1] [n2]	Sets relative position.	Sets the print starting position based on the current position.
33	[ESC] a [n]	Aligns print data positions	Valid only at the beginning of a line.
34	[ESC] c0 [n]	Selects print sheet (R/J).	Valid only at the beginning of a line.
35	[ESC] c1 [n]	Selects print sheet (R/J) covered by line feed amount setting. Valid even during printing.	
36	[ESC] c4 [n]	Selects paper-out detector to stop printing.	

No.	Command	Function	Remarks
37	[ESC] c5 [n]	Enables/disables panel switch.	
38	[ESC] d [n]	Prints and feeds paper by the specified number of lines.	
39	[ESC]i	Causes full cutting	Valid only at the beginning of a line.
40	[ESC] m	Causes partial cutting	Valid only at the beginning of a line.
41	[ESC] o	Prints stamp.	Valid only at the beginning of a line.
42	[ESC] p [m] [t1] [t2]	Generates specified pulse.	
43	[ESC] q [data]	Sets power failure mark.	
44	[ESC] t [n]	Selects character code table.	
45	[ESC] u [n]	Transmits drawer connector status.	
46	[ESC] v	Transmits paper detector status.	
47	[ESC] z [n]	Sets/cancels the printing of the same data on receipt/journal.	Valid only at the beginning of a line.
48	[ESC] { [n]	Sets/cancels upside-down character printing.	Valid only at the beginning of a line.
49	[GS] ! [n]	Selects character size.	
50	[GS] * [n1] [n2] [data] n1xn2x8	Sets image data. n1: Horizontal size n2: Vertical size	
51	[GS] / [n]	Prints image data.	
52	[GS] :	Sets starting/ending position of macro definition.	
53	[GS]^ [r] [t] [m]	Executes macro.	The number of times, interval and mode of execution can be set.
54	[GS] E [n]	Selects print density.	
55	[GS] H [n]	Select printing position of HRI character	
56	[GS] I [n]	Transmits printer ID.	ROM version etc. are transmitted.
57	[GS] P [n1] [n2]	Sets basic line feed pitch.	
58	① [GS] V [m] ② [GS] V [m] [n]	Cuts paper.	Valid only at the beginning of a line.
59	[GS] a [n]	Enables/disables automatic status transmission.	
60	[GS] f [n]	Selects font for HRI character.	Font A and Font B can be set.
61	[GS] h [n]	Selects height of bar code.	Number of dots.
62	① [GS] k [m] [data] k [00] ② [GS] k [m] [n] [data]	Selects bar code system and prints bar code.	
63	[GS] r [n]	Transmit status.	Status: Same as [ESC] v and [ESC] u.
64	[GS] w [n]	Selects horizontal size of bar code.	

2. Command description

No.	COMMAND	FUNCTION	CODE
1	LF	Print and line feed	<0Ah>

[Function]

Standard mode)

Prints data in the print buffer and advances the paper by the previously set amount.
Moves the print position to the beginning of the next line.

Page mode)

Does not print data in the print buffer.
Advances the paper by the previously set amount.
Moves the print position to the beginning of the next line.

[Reference]

[ESC] 2: Sets the line feed amount to 30/203 inch (30 dots).

[ESC] 3: Sets the line feed amount.

No.	COMMAND	FUNCTION	CODE
2	FF	Page mode print and return	<0Ch>

[Function]

Standard mode)

No function

Page mode)

Prints all the print data in one page.
Then returns to the standard mode.
The print data is all erased after printing.

[Notes]

This command is valid for the page mode only.

The print position is moved to the beginning of the next line.

Paper cutting is not performed.

To perform paper cutting, it is necessary to send the paper cut command before sending this command.

Print data put in line feed codes is printed.

[Reference]

[ESC] FF: Remains in the page mode.

No.	COMMAND	FUNCTION	CODE
3	RS	Journal tab	<1Eg>

[Function]

Moves the print position to the beginning of journal paper.

[Notes]

This command is valid only when receipt/journal same data printing is canceled.

ERO1PU cannot print data during receipt/journal.

However, print data can be edited and set during receipt/journal in light of data compatibility, for ordinary receipt/journal printers can print data then.

Therefore, be sure to set this command at the beginning when setting the print data in the journal side.

[Reference]

[ESC] Z: Select/cancel R/J same data printing

No.	COMMAND	FUNCTION	CODE
4	CAN	Cancel print data	<18h>

[Function]

Standard mode)

Erases one line of print data not put in line feed codes in the receive buffer.

Page mode)

Erases one page of print data not put in FF codes in the receive buffer.
Moves the print position to the beginning of journal paper.

[Notes]

When print data may be missed due to power failure, etc. during printing, it is necessary to resend print data after recovery for correct printing. This command is provided mainly for such cases.

In the standard mode, it is possible to cancel a line for which power failure is caused during receiving.

In the page mode, it is possible to cancel a page for which power failure is caused during receiving.

No.	COMMAND	FUNCTION	CODE
5	SI	Selects character height reduction	<0Fh>

[Function]

Starts character height reduction.

Reduces the character height to 1/2 by removing bits one by one.

[Note]

This command is valid only when set at the beginning of a line.

[Reference]

[DC2]: Cancel character height reduction

No.	COMMAND	FUNCTION	CODE
6	DC2	Cancel character height reduction	<12h>

[Function]

Cancels character height reduction.

[Notes]

This command is valid only when set at the beginning of a line.

[Reference]

[SI]: Select character height reduction

No.	COMMAND	FUNCTION	CODE
7	DLE EOT n	Transmit status in real time	<10h><04h>n

[Range]

$1 \leqq n \leqq 4$

[Function]

Transmits the status in real time by setting "n".

n	Function
1	Transmits the printer status.
2	Transmits the offline factor status.
3	Transmits the error factor status.
4	Transmits the paper detector status.

This command is executed regardless of the state of the host computer. (The DSR signal is not checked.)

This command is executed even if offline, receive buffer full or error states are provided.

Status transmission is made immediately when this command is received.

n=1; Printer status

bit	Function	Value 0/1
0	Not used	Fixed to 0
1	Not used	Fixed to 1
2	Drawer status	"L"/"H"
3	Online/Offline state	online/Offline
4	Not used	Fixed to 1
5	Not defined	
6	Not defined	
7	Not used	Fixed to 0

n=2; Offline factor status

bit	Function	Value 0/1
0	Not used	Fixed to 0
1	Not used	Fixed to 1
2	HEAD UP LEVER	Close/Open
3	Paper feed SW	Paper not being fed/Paper being fed
4	Not used	Fixed to 1
5	Print stop due to no paper	Not stopping/Stopping
6	Error state	No error caused/Error caused
7	Not used	Fixed to 0

bit 5; Becomes 1 in case of print stop set by [ESC]c0 and [ESC]c4.

n=3; Error factor status

bit	Function	Value 0/1
0	Not used	Fixed to 0
1	Not used	Fixed to 1
2	RS232 Receive Error	No error caused/Error caused
3	Auto cutter error	No error caused/Error caused
4	Not used	Fixed to 1
5	Unrecoverable printer error	No error caused/Error caused
6	Head temperature rise	No error caused/Error caused
7	Not used	Fixed to 0

n=4; Paper detector status

bit	Function	Value 0/1
0	Not used	Fixed to 0
1	Not used	Fixed to 1
2	Near end detector	Paper is present/Paper is out
3	Not used	Fixed to 0
4	Not used	Fixed to 1
5	Journal end detector	Paper is present/Paper is out
6	Receipt end detector	Paper is present/Paper is out
7	Not used	Fixed to 0

[Notes]

Status transmission is also made when data of 10h, 04h and n (1 ≦ n ≦ 4) is received.

<Example>

In case of D1=10h, D2=04h and D3=01h with ESC * n1 n2 [DATA] k.

No.	COMMAND	FUNCTION	CODE
8	DLE ENQ n	Request status in real time	<10h><05h>n

[Range]

1 ≦ n ≦ 2

[Function]

Responds to requests from the host computer by setting "n".

n	Function
1	Recovers from the error and restarts printing at the beginning of the line where the error is caused.
2	Restarts printing after clearing the receive buffer and print buffer.

This command is executed regardless of the state of the host computer. (The DSR signal is not checked.)

This command is executed even if offline, receive buffer full or error states are provided.

This command is executed immediately when it is received (without being entered in the receive buffer).

No.	COMMAND	FUNCTION	CODE
9	ESC FF	Page mode print	<1Bh><0Ch>

[Function]

Standard mode)

No function

Page mode)

Prints all the print data in one page.
Then remains in the page mode.
The print data is all erased after printing.

[Notes]

This command is valid for the page mode only.

The print position is moved to the beginning of the next line.

Paper cutting is not performed.

To perform paper cutting, it is necessary to send the paper cut command before sending this command.

Print data put in line feed codes is printed.

[Reference]

FF: Return to the standard mode after printing.

No.	COMMAND	FUNCTION	CODE
10	ESC SP n	Set character right side spacing	<1Bh><20h> n

[Range]

0 ≦ n ≦ 255

[Function]

Sets the space on the right side of each character in basic calculation pitches.

The space on the right side of each character is [n × (basic calculation pitch)] inches.

[Notes]

If double-width and quadruple-width are selected, the amount of space on the right side of each character is doubled and quadrupled.

Space is provided on the right side of each character even in case of lateral turning.

[n × (basic calculation pitch)] is calculated when this command is received.

Therefore, this setting is not changed only by changing the basic calculation pitch through GS P.

[Default]

n = 0

[Reference]

GS P: Set basic calculation pitch

ESC !: Set character mode

GS !: Set character size

[Print example]

AAAA AAAA

No.	COMMAND	FUNCTION	CODE
11	ESC ! n	Set character mode	<1Bh><21h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects the character mode.

The meaning of each bit of "n" is as follows.

bit	Function
0	0: Character font 12 × 24
	1: Character font 9 × 24
1	Not defined
2	Not defined
3	Not defined
4	0: Double-height canceled
	1: Double-height selected
5	0: Double-width canceled
	1: Double-width selected
6	Not defined
7	0: Underline canceled
	1: Underline selected

[Notes]

No underline is provided in the following cases.

1) Portions skipped with journal tab
2) Laterally-turned character
3) Blank portions specified by set absolute position/set relative position

When both double-height and double-width are selected at the same time, quadruple characters are printed.

This setting can be changed within one line.

If there are both double-height characters and normal characters in one line, they are aligned on the base line.

[Default]

n = 0

[Reference]

GS P: Set basic calculation pitch

ESC !: Set character mode

GS !: Set character size

[Print example]

AAAAAAA

No.	COMMAND	FUNCTION	CODE
12	ESC $ m n	Set absolute position	<1Bh><24h> n

[Range]

0 ≦ m ≦ 255
0 ≦ n ≦ 255

[Function]

Based on the beginning of the line, sets the print starting position through calculation using the basic calculation pitch.

The distance between the print starting position and the beginning of the line is as follows.

(m + n × 256) × (basic calculation pitch)

[Notes]

Any specification that exceeds the end of the line is ignored.

(The end of the line: Receipt width when R/J same data printing is selected; Receipt width + Journal width + Width between R/J when R/J same data printing is canceled)

This calculation is made based on the basic pitch in the horizontal direction.

In case of overlapping with the print data expanded currently, over-printing is performed.

[Reference]

ESC\: Set relative position

No.	COMMAND	FUNCTION	CODE
13	ESC % n	Select/cancel user-defined character	<1Bh><25h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects or cancels the mode for make printable the preset user-defined character data.

bit 0 of "n" = 1: User-defined character selected

bit 0 of "n" = 0: User-defined character canceled

[Notes]

- There are other jobs for user-defined character setting.
- When the character code set for user-defined character is selected after selecting the user-defined character mode, the user-defined character is printed.
- When the character code not set for user-defined character is selected, the normal character is printed.

[Default]

n = 0

[Reference]

ESC &: Set user-defined character

ESC ?: Delete user-defined character

No.	COMMAND	FUNCTION	CODE
14	ESC & 03 C1 C2 (n[DATA]nx3) C2-C1	Define user-defined character	<1Bh><26h><03h>

[Range]

32 ≦ C1 ≦ C2 ≦ 126: User-defined character range (C1 to C2)

0 ≦ DATA1 ··· DATAn ≦ 255: Print bit data

0 ≦ n ≦9: 9 × 24 font selected

0 ≦ n ≦ 12: 12 × 24 font selected

[Function]

- Sets user-defined characters.
- 03h indicates the number of bytes in the vertical direction. C1 Indicates the beginning user-defined character code; C2 indicates the ending user-defined character code. ••• User-defined character setting from C1 to C2 can be made with this command. If only one character is defined, use C1=C2.
- The character code range is from ASCII code 20h to 7Eh and the total number of characters is 95.

[Example]

[ESC] & 03 32 33 12 [DATA1].....[DATA36] 12 [DATA1].....[DATA36]

C1C2 n n

[Notes]

The set user-defined character data is not cleared until the MASTER RESET and ESC @ commands are received.

If the above-mentioned data is out of the range, the setting is disabled.

[Default]

n = 0

[Reference]

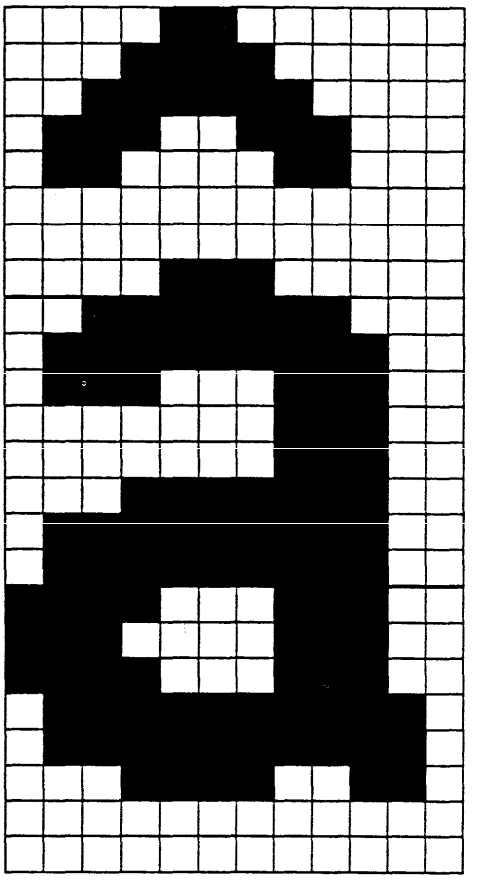
ESC %: Select/cancel user-defined character

ESC ?: Delete user-defined character

Setting example)

- In case of font A

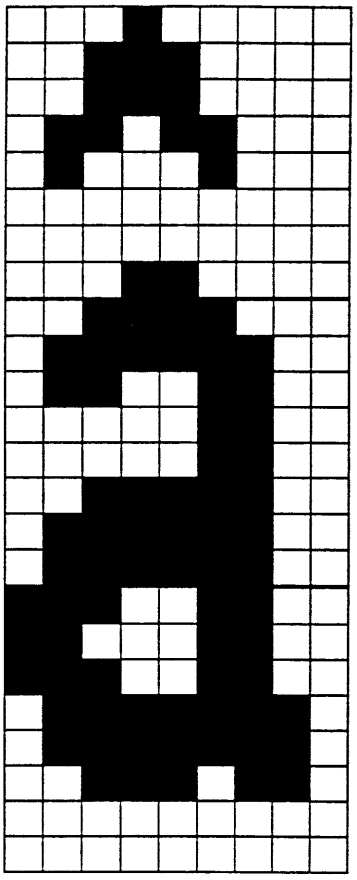
d1	d4	d7	d10	d13	d16	d19	d22	d25	d28	d31	d34
d2	d5	d8	d11	d14	d17	d20	d23	d26	d29	d32	d35
d3	d6	d9	d12	d15	d18	d21	d24	d27	d30	d33	d36



d1=<00h> d4=<18H>.....
d2=<00h> d5=<63h>.....
d3=<E0h> d6=<F8h>.....

- In case of font B

d1	d4	d7	d10	d13	d16	d19	d22	d25
d2	d5	d8	d11	d14	d17	d20	d23	d26
d3	d6	d9	d12	d15	d18	d21	d24	d27



d1=<00h> d4=<18H>.....
d2=<00h> d5=<63h>.....
d3=<E0h> d6=<F8h>.....

No.	COMMAND	FUNCTION	CODE
15	ESC * m n1 n2 [DATA] k	Set bit image data	<1Bh><2Ah>...

[Range]

m = 0, 1, 32, 33

0 ≦ n1 ≦ 255

0 ≦ n2 ≦ 3

0 ≦ data ≦ 255

k = n1 + n2 × 256 (In case of m = 0,1)

k = (n1 + n2 × 256) × 3 (In case of m = 32,33)

[Function]

- Expand to the print buffer the bit image data specified by "data" using the density specified by "m".
- (n1 +n2×256) represents the number of dots in horizontal direction of the bit image data to be printed.
- If the bit image data exceeds the number of printable dots in one line, the excess data is ignored.
- When the image data is to be printed, the corresponding bit is 1; otherwise it is 0.

- The image modes selectable by "m" are as follows.

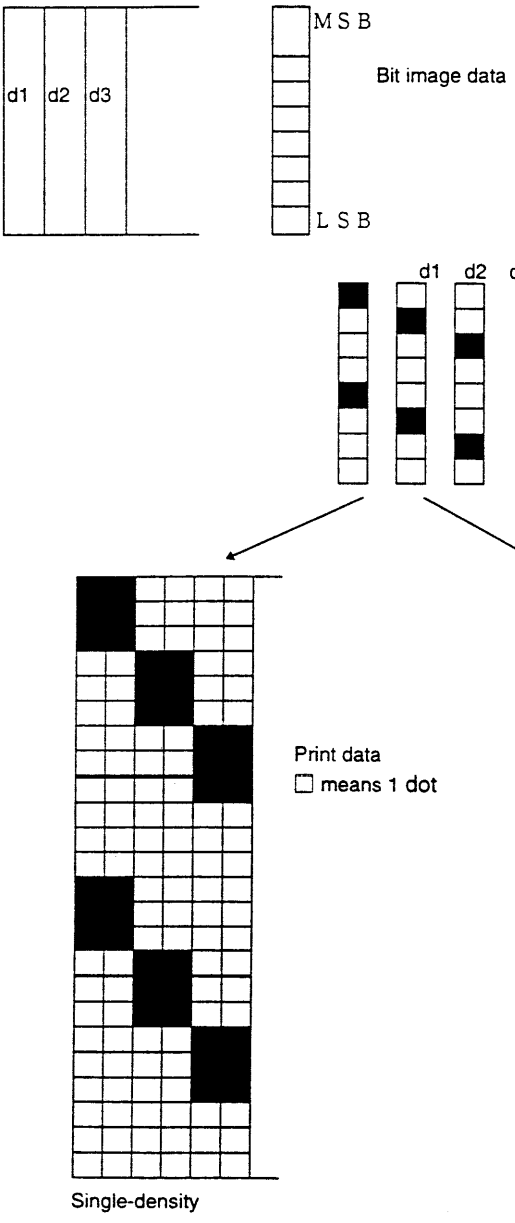
m	Mode	Number of dots in vertical direction	Maximum number of dots in horizontal direction
0	8-dot single-density	8	192
1	8-dot double-density	8	360
32	24-dot single-density	24	192
33	24-dot double-density	24	360

[Notes]

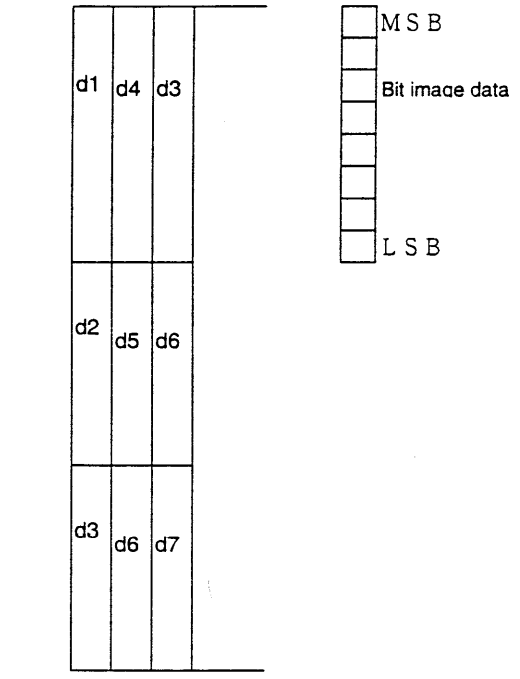
- The set user-defined character data is not cleared until the MASTER RESET and ESC @ commands are received.
- If the above-mentioned data is out of the range, the setting is disabled.

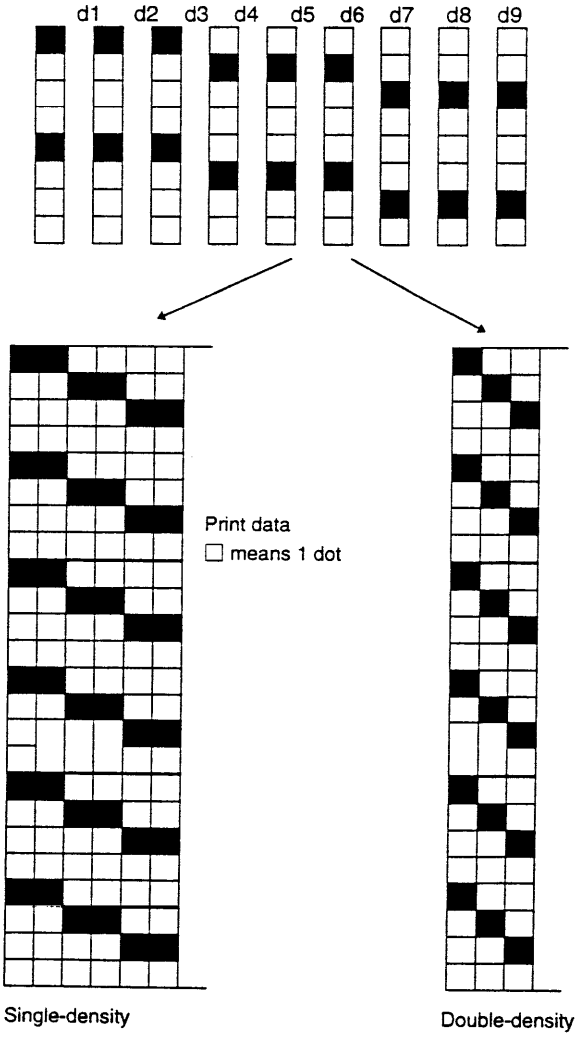
Bit image data print example)

8-dot bit image



24-dot bit image





No.	COMMAND	FUNCTION	CODE
16	ESC - n	Select/cancel underline	<1Bh><2Dh> n

[Range]

0 ≦ n ≦ 2
48 ≦ n ≦ 50

[Function]

Selects or cancels the underline.

- When n=0 or 48, the underline is canceled.
- When n=1 or 49, the 2-dot-wide underline is selected.
- When n=2 or 50, the 3-dot-wide underline is selected.

[Notes]

No underline is provided in the following cases.

1) Portions skipped with journal tab
2) Laterally-turned character
3) Blank portions specified by set absolute position/set relative position

The same processing as "select/cancel underline" using ESC ! is performed.

[Default]

n = 0

[Reference]

ESC !

No.	COMMAND	FUNCTION	CODE
17	ESC 2	Set 30/203 inch line feed amount	<1Bh><32h>

[Function]

Sets the distance for one line feed to 30/203 inch.

The line spacing is 6 dots.

Caution

In case of double-height, the line spacing is 0 dots.
If the line spacing is less than 6 dots,
printing may be disturbed when printing is started from the printer stop state.
In this case, printing must be made with the printer in the operating state
(continuous printing from the previous line).

[Reference]

ESC 3: Set line feed amount

No.	COMMAND	FUNCTION	CODE
18	ESC 3 n	Set line feed amount	<1Bh><33h>

[Range]

0 ≦ n ≦ 255

[Function]

Sets the distance for one line feed to [n ×(basic calculation pitch)] inch.

Caution

If the line spacing is less than 6 dots, printing may be disturbed when printing is started from the printer stop state. In this case, printing must be made with the printer in the operating state (continuous printing from the previous line).

[Default]

n = 30 (30/203 inch)

[Reference]

ESC 2: Set 30/203 inch line feed amount

No.	COMMAND	FUNCTION	CODE
19	ESC 4 n [DATA] k	Set logo stamp	<1Bh><34h> n ...

[Range]

0 ≦ n ≦ 160: Number of dots in vertical direction

k = 45 × n

[Function]

Sets the logo stamp.

Setting is made with side slice.

Stamp setting of MAX 20 mm in vertical size is possible.

[Notes]

6-dot feed is performed before the logo stamp data is printed.

[Default]

n= 160 (30/203 inch)

DATA =

YOUR RECEIPT
THANK YOU

[Reference]

ESC o: Print logo stamp

[Notice]

ER01PU can not receive a data during writing the logo stamp data in internal memory.

ER01PU inform it to host by sending XOFF character or turning off DTR signal.

When you turn off ER01PU or you execute Master Reset,this data is remained.

So,you need not to execute it frequently.

No.	COMMAND	FUNCTION	CODE
20	—	—	(Reserved)

No.	COMMAND	FUNCTION	CODE
21	ESC = n	Set peripheral device	<1Bh><3Dh> n

[Range]

0 ≦ n ≦ 255

[Function]

Sets the operation of the peripheral devices.

bit	Peripheral device	1/0
0	Printer	Valid/Disabled

[Default]

n = 3

No.	COMMAND	FUNCTION	CODE
22	ESC ? n	Delete user-defined character	<1Bh><3Fh> n

[Range]

32 ≦ n ≦ 126

[Function]

Deletes the user-defined character for the specified code.

[Notes]

The specified code is set to the normal character.

[Reference]

ESC &: Set user-defined character

ESC %: Select user-defined character

No.	COMMAND	FUNCTION	CODE
23	ESC @	Initialize printer	<1Bh><40h>

[Function]

Initializes the printer setting data.

[Notes]

The following data are not initialized.

Macro setting data
Receive buffer data
Stamp data

No.	COMMAND	FUNCTION	CODE
24	ESC J n	Print and feed paper	<1Bh><4Ah>

[Range]

0 ≦ n ≦ 255

[Function]

Prints the data in the print buffer and feeds the paper for "n × (basic calculation pitch)".

No.	COMMAND	FUNCTION	CODE
25	ESC L	Select page mode	<1Bh><4Ch>

[Function]

Switches from the standard mode to the page mode.

[Notes]

This command is valid only when entered at the beginning of a line.

[Reference]

FF: Prints the page data

No.	COMMAND	FUNCTION	CODE
26	ESC N	Buzzer ON	<1Bh><4Eh>

[Function]

Sounds the buzzer.

No.	COMMAND	FUNCTION	CODE
27	ESC O	Buzzer OFF	<1Bh><4Fh>

[Function]

Stops the buzzer.

No.	COMMAND	FUNCTION	CODE
28	ESC NAK n	Buzzer ON/OFF	<1Bh><15h> n

[Range]

0 ≦ n ≦ 255

[Function]

Makes the buzzer ON/OFF for a certain time.

(n ×10 msec)

No.	COMMAND	FUNCTION	CODE
29	ESC Rn	Select international character	<1Bh><52h>

[Range]

0 ≦ n ≦ 10

[Function]

Selects a character set among those shown in the table below according to the value of "n".

n	Character set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

[Notes]

If "n" is out of the range, this command is ignored.

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
30	ESC S	Select standard mode	<1Bh><53h>

[Function]

Switches from the page mode to the standard mode.

[Notes]

This command is valid only when entered at the beginning of a line.

[Reference]

ESC L: Select page mode

No.	COMMAND	FUNCTION	CODE
31	ESC V n	Set/cancel 90clockwise rotated character printing	<1Bh><56h> n

[Range]

0 ≦ n ≦ 1 48 ≦ n ≦ 49

[Function]

Sets or cancels 90° cw (clockwise) rotated character printing according to the value of "n".

n	Function
0, 48	Cancels 90° cw rotated character printing
1, 49	Sets 90° cw rotated character printing

[Notes]

No underline is provided for 90° cw (clockwise) rotated characters.

Double-width/double-height setting is reversed.

If "n" is out of the range, this command is ignored.

[Default]

n = 0

[Reference]

ESC SP: Right margin setting valid

ESC !: No underline is printed.

Double-width/double-height setting is reversed.

No.	COMMAND	FUNCTION	CODE
32	ESC \ mn	Set relative position	<1Bh><5Ch> mn

[Range]

0 ≦ m ≦ 255

0 ≦ n ≦ 255

[Function]

Based on the current position, sets the print starting position through calculation using the basic calculation pitch.

- A positive number specifies the print starting position to the right of the current position; a negative number to the left.
- Negative numbers are specified using the supplement of N.

The print starting position is determined through the following calculation.

To the right

m + n × 256 = N

Example

1 dot to the right: m=1, n=0

2 dots to the right: m=2, n=0

3 dots to the right: m=3, n=0

:

360 dots to the right: m=104, n=1

:

To the left

m + n × 256 65536 – N

Example

1 dot to the left: m=255, n=255

2 dots to the left: m=254, n=255

3 dots to the left: m=253, n=255

:

360 dots to the left: m=154, n=254

:

The distance between the print starting position and the beginning of the line is as follows.

N × (basic calculation pitch)

[Notes]

- Any specification that exceeds the end of the line is ignored. (The end of the line: Receipt width when R/J same data printing is selected; Receipt width + Journal width + Width between R/J when R/J same data printing is canceled)
- This calculation is made based on the basic pitch in the horizontal direction.
- In case of overlapping with the print data expanded currently, overprinting is performed.

[Reference]

ESC $: Set absolute position

No.	COMMAND	FUNCTION	CODE
33	ESC a n	Align positions	<1Bh><61h> n

[Range]

0 ≦ n ≦ 2

48 ≦ n ≦ 50

[Function]

Aligns all the data in one line to the specified position.

The value of "n" specifies the alignment as follows.

n	Position
0, 48	Align left
1, 49	Align center
2, 50	Align right

[Notes]

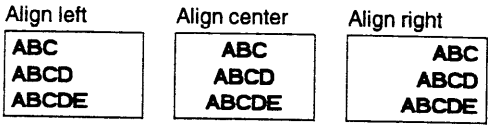
This command is valid only when set at the beginning of a line. Blank portions specified by set absolute position/set relative position are also covered by this command.

Position alignment is performed separately for R and J.

[Default]

n = 0

[Print example]



No.	COMMAND	FUNCTION	CODE
34	ESC c 0 n	Select print sheet (R/J)	<1Bh><63h><30h> n

[Range]

0 ≦ n ≦ 2

[Function]

Enables or disables the print sheet (R/J).

The meaning of each bit of "n" is as follows.

bit	Description	0/1
0	Journal printer	Disabled/Enabled
1	Receipt printer	Disabled/Enabled
2		
3		
4		
5		
6		
7		

[Notes]

Valid only at the beginning of a line

[Default]

n = 3

No.	COMMAND	FUNCTION	CODE
35	ESC c 1 n	Select print sheet covered by line feed amount setting	<1Bh><63h><31h> n

[Range]

0 ≦ n ≦ 3

[Function]

Enables or disables the data of line feed amount setting (ESC2/ESC3) by print sheet (receipt/journal).

The meaning of each bit of "n" is as follows.

bit	Description	0/1
0	Journal printer	Disabled/Enabled
1	Receipt printer	Disabled/Enabled
2		
3		
4		
5		
6		
7		

[Notes]

Valid only at the beginning of a line

[Default]

n = 3

No.	COMMAND	FUNCTION	CODE
36	ESC c 4 n	Select paper-end detector to stop printing	<1Bh><63h><34h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects which paper-end detector causes the printer to stop printing.

When printing is stopped, the line being printed is completed.

Even if printing stop is invalid, the printer stops printing and the print data is discarded when the paper is out.

The meaning of each bit of "n" is as follows.

bit	Description	0/1
0	Near-end detector	Invalid/Valid
1		
2	Journal end detector	Invalid/Valid
3	Receipt end detector	Invalid/Valid
4		
5		
6		
7		

[Notes]

Whether the printer goes OFF-LINE or not depends on the setting of the dip switch.

Caution

When the presetting of Receipt is different form Journal and if the line spacing is less than 6 dots, printing may be disturbed when printing is started from the printer stop state.

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
37	ESC c 5 n	Enable/disable panel switch	<1Bh><63h><35h> n

[Range]

0 ≦ n ≦ 255

[Function]

Enables or disables the panel switch.

Only the lowest bit of "n" is valid.

When n=*******0, the panel switch is enabled.
When n=*******1, the panel switch is disabled.

[Notes]

This command is valid for the receipt feed key, journal feed key and online key.

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
38	ESC d n	Print and feed paper "n" lines	<1Bh><64h> n

[Range]

0 ≦ n ≦ 255

[Function]

Prints the data in the print buffer and feed the paper for "n" lines.

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
39	ESC i	Full cut	<1Bh><69h>

[Function]

Executes a full cut of the paper.

[Notes]

Valid only at the beginning of a line

Causion:

After this command is executed, You had better execute one line feed or one line print to prevent the Paper Jam.

No.	COMMAND	FUNCTION	CODE
40	ESC m	Partial cut	<1Bh><6Dh>

[Function]

Executes a partial cut of the paper.

[Notes]

Valid only at the beginning of a line

Causion:

After this command is executed, You had better execute one line feed or one line print to prevent the Paper Jam.

No.	COMMAND	FUNCTION	CODE
41	ESC o	Print stamp	<1Bh><6Fh>

[Function]

Stamp printing of MAX 20 mm in vertical size is performed.

[Notes]

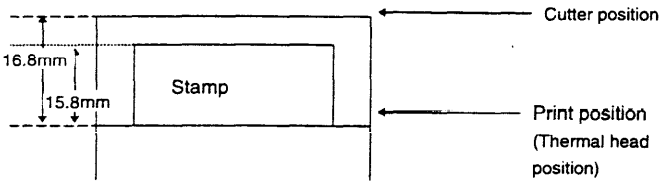
Valid only at the beginning of a line.

The stamp data is printed on the receipt side only.

6-dot feed is performed regardless of the line feed pitch setting before the stamp data is printed.

[Reference]

A distance of 16.8 mm is provided between the cutter position and thermal head <1 position. In printing the stamp between them, vertical size of 15.8 mm can be used.



The following methods are used to print the stamp data between the cut position and print position.

1) Execution of print stamp command (ESC o)

2) Execution of cut command (ESC I)

Stamp printing in this case is for the next receipt.

No.	COMMAND	FUNCTION	CODE
42	ESC p m t1 t2	Generate specified pulse	<1Bh><70h> p m t1 t2

[Range]

m = 0, 1, 48, 49

0 ≦ t1 ≦ t2 ≦ 255

[Function]

Outputs the specified pulse on the drawer connector.

For connector pin "m", the signal is held ON for t1 × 2 ms and OFF for t 1 ×2 ms.

The value of "m" is used as follows.

m	Connector
0, 48	Drawer 1
1, 49	Drawer 2

[Notes]

When opening the Sharp drawer, 20 ≦ t1 ≦ 25 and 250 ≦ t2 must be applied.

No.	COMMAND	FUNCTION	CODE
43	ESC q DATA	Set power failure mark	<1Bh><71h> DATA

[Range]

0 ≦ DATA ≦ 255

DATA: ASCII code

[Function]

Prints the mark of interrupted printing when power failure is caused during printing.

Sets this mark.

Performs one-line printing of this character when power failure is caused during printing.

[Default]

DATA : "=" (3Dh)

No.	COMMAND	FUNCTION	CODE
44	ESC t n	Select character code table	<1Bh><74h> n

[Range]

0 ≦ n ≦ 255

254 ≦ n ≦ 255

[Function]

Selects the character listed on page "n" of the character code table.

Page	Character type
0	USA:EUROPE
1	Japanese (Katakana)
2	Multilingual
3	Portuguese
4	Canadian-French
5	Nordic
6	Greece
7	Slav
254	Sharp special character
255	Blank page

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
45	ESC u n	Transmit drawer connector status	<1Bh><75h> n

[Range]

0 = 0, 48

[Function]

Transmits the status of the drawer connector pin.

The status is as shown below.

bit	Status	1/0
0	Drawer	Open/Close
1	Not defined	
2	Not defined	
3	Not defined	
4	Fixed to 0	
5	Not defined	
6	Not defined	
7	Fixed to 0	

[Notes]

If nothing is connected to the connector, bit 0 is always equal to 0.

When DTR/DSR control is selected, the status is transmitted after the printer confirms that the host computer is ready to receive data (DSR signal is ON). If the host computer is not ready to receive data (DSR signal is OFF), the printer waits until the computer is ready.

When XON/XOFF control is selected, one byte is transmitted without checking if is ready to receive data.

This command is executed during receive buffer expansion. Therefore, if there is other data in the receive buffer, some delay may be caused between command receiving and status transmitting.

[Reference]

DLE EOT: Transmit status in real time

GS a: Transmit automatic status

GS r: Transmit status

No.	COMMAND	FUNCTION	CODE
46	ESC v	Transmit paper detector status	<1Bh><76h>

[Function]

Transmits the status of the paper detector when the command is executed.

The status to be transmitted is as shown below.

bit	Function	Value 0/1
0	Near-end detector	Paper is present/Paper is out
1	Not defined	
2	Journal-end detector	Paper is present/Paper is out
3	Receipt-end detector	Paper is present/Paper is out
4	Not used	Fixed to 0
5	Not defined	
6	Not defined	
7	Not used	Fixed to 0

[Notes]

When DTR/DSR control is selected, the status is transmitted after the printer confirms that the host computer is ready to receive data (DSR signal is ON). If the host computer is not ready to receive data (DSR signal is OFF), the printer waits until the computer is ready.

When XON/XOFF control is selected, one byte is transmitted without checking if is ready to receive data.

This command is executed during receive buffer expansion. Therefore, if there is other data in the receive buffer, some delay may be caused between command receiving and status transmitting.

[Reference]

DLE EOT: Transmit status in real time

GS a: Transmit automatic status

GS r: Transmit status

No.	COMMAND	FUNCTION	CODE
47	ESC z n	Select/cancel receipt/journal same data printing	<1Bh><7Ah> n

[Range]

0 ≦ n ≦ 255

[Function]

Select or cancel printing the same data on the receipt/journal. When the value of bit 0 of "n" is equal to 0, same data printing is canceled.

When the value of bit 0 of "n" is equal to 1, same data printing is selected.

When same data printing is selected, the amount of data to be sent from the host computer may be for one print sheet only (360 dots).

[Notes]

Valid only at the beginning of a line.

No.	COMMAND	FUNCTION	CODE
48	ESC { n	Set/cancel upside-down character printing	<1Bh><7Bh> n

[Range]

0 ≦ n ≦ 255

[Function]

Sets or cancels upside-down character printing.

Only the lowest bit of "n" is valid.

When bit 0 is equal to 0, upside-down character printing is canceled.

When bit 0 is equal to 1, upside-down character printing is set.

[Notes]

Valid only when entered at the beginning of a line.

[Default]

n = 0

No.	COMMAND	FUNCTION	CODE
49	GS ! n	Select character size	<1Dh><21h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects the character size of Normal/Double/Quadruple (Height and Width).

bit	Function	
0	Height	000 : Normal
1		001 : Double
2		011 : Quadruple
3		
4	Width	000 : Normal
5		001 : Double
6		011 : Quadruple
7		

[Notes]

Height represents the vertical direction; width represents the horizontal direction.

When 90° cw rotated character printing is set, height and width are reversed.

Double-height/double-width selected using ESC ! is disabled by this command.

[Default]

n = 0

[Reference]

[ESC] !: Set character mode

No.	COMMAND	FUNCTION	CODE
50	GS * n1 n2 [data] k	Set image data	<1Dh><2Ah> ...

[Range]

1 ≦ n1 ≦ 45: Horizontal size

1 ≦ n2 ≦ 255: Vertical size

n1 × n2 ≦ 1800

0 ≦ data ≦ 255

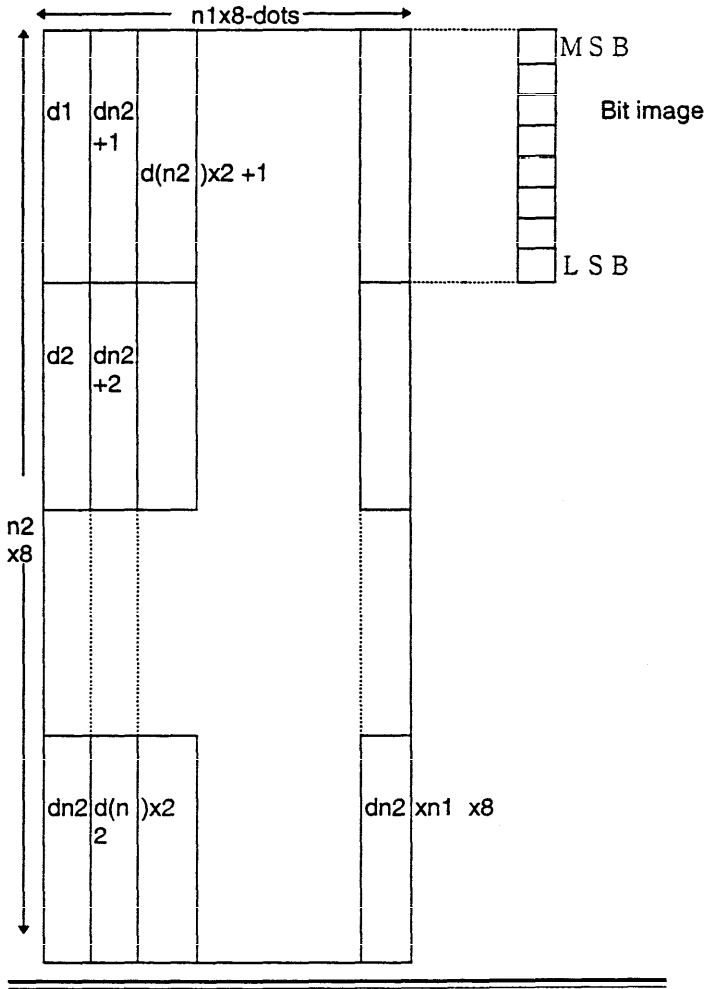
[Function]

- Defines the image data with the number of dots specified by n1 and n2.
  The number of dots in the horizontal direction is n1×8, and in the vertical direction is n2 × 8.
- "data" specifies the bit image data.
  Black printing is 1; white printing is 0.

[Notes]

- The set user-defined character data is not cleared until the MASTER RESET and ESC @ commands are received.
- If the above-mentioned data is out of the range, the setting is disabled.

Image data memory structure



No.	COMMAND	FUNCTION	CODE
51	GS / n	Print image data	<1Dh><2Fh> n

[Range]

0 ≦ n ≦ 3, 48 ≦ n ≦ 51

[Function]

Prints the image data using the print mode specified by "m". The dot density selected by "m" is shown below.

m	Print mode
0, 48	Normal mode
1, 49	Double-width mode
2, 50	Double-height mode
3, 51	Quadruple mode

[Notes]

Image data printing is ignored while printing is performed.

If the image data exceeds one line, the excess data is not printed.

The stamp data is printed on the receipt side only.

6-dot feed is performed regardless of the line feed pitch setting before the stamp data is printed.

[Reference]

[GS] *: Set image data

No.	COMMAND	FUNCTION	CODE
52	GS:	Set starting/ending position of macro definition	<1Dh><3Ah>

[Function]

Specifies the starting or ending position of the macro definition.

If this command is received while defining the macro, it ends the definition.

[Notes]

The macro range can be set up to 2048 bytes.

Even if ESC @ is executed, the macro definition is not cleared.

Normal printing operation is possible while defining the macro.

[Reference]

[GS] ^: Execute macro

No.	COMMAND	FUNCTION	CODE
53	GS ^ r t m	Execute macro	<1Dh><5Eh> ...

[Function]

Executes the macro definition.

r: Specifies the number of times to execute the macro.

t: Specifies the waiting time for executing the macro.

Waiting time of t×100 msec is required for one execution: Specifies the macro executing mode.

m = 0 Continuous macro execution.
Executes "r" times continuously at the interval specified by "t".

m = 1 Executes the macro by pressing the receipt paper feed key.
After waiting the period specified by "t", the PAPER LED blinks and the printer waits for the receipt paper feed key to be pressed. After the receipt paper feed key is pressed, the printer executes the macro once. The printer repeats this operation "r" times.

[Notes]

If this command is received while defining the macro, the macro definition is aborted.

If the macro is not defined or if "r" is 0, nothing is executed.

Paper cannot be fed with the receipt paper feed key while executing the macro when "m" is 1.

[Reference]

[GS]: Set starting/ending position of macro definition

No.	COMMAND	FUNCTION	CODE
54	GS E n	Select print dendity	<1Dh><45h> n

[Range]

0 ≦ n ≦ 99

[Function]

Selects the print density.

n = 00: 65% of standard density (P)

n = 50: Standard density (P)

n = 99: 135 % of standard density (P)

[Default]

n = 50

No.	COMMAND	FUNCTION	CODE
55	GS H n	Select printing position of HRI character	<1Dh><48h> n

[Range]

0 ≦ n ≦ 3, 48 ≦ n ≦ 51

[Function]

Selects the HRI character printing position of HRI characters when printing the bar code.

The printing position selected by "n" is shown below.

n	Printing position
0, 48	Not printed
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above and below the bar code

[Notes]

HRI characters are printed using the font specified by GS f.[Default]

[Default]

n = 0

[Reference]

GS f:: Select font for HRI character

No.	COMMAND	FUNCTION	CODE
56	GS I n	Transmit printer ID	<1Dh><49h> n

[Range]

1 ≦ n ≦ 3, 49 ≦ n ≦ 51

[Function]

Transmits the printer ID shown below according to "n" when executing the command.

n	Type	Details	Data
1, 49	Model	ER-01PU	01h
2, 50	Set ID	See the table below	
3, 51	ROM version	ROM version	Ex) 1Ah

bit	Description
0	Ready for kanji character Yes/No 1/0
1	Not defined
2	Not defined
3	Not defined
4	Fixed to 0
5	Not defined
6	Fixed to 0
7	Fixed to 0

[Notes]

When DTR/DSR control is selected, the status is transmitted after the printer confirms that the host computer is ready to receive data (DSR signal is ON). If the host computer is not ready to receive data (DSR signal is OFF), the printer waits until the computer is ready.

When XON/XOFF control is selected, one byte is transmitted without checking if is ready to receive data.

This command is executed during receive buffer expansion. Therefore, if there is other data in the receive buffer, some delay may be caused between command receiving and status transmitting.

The ROM version is changed each time the ROM is changed.

No.	COMMAND	FUNCTION	CODE
57	GSP xy	Set basic line feed pitch	<1Dh><50h> x y

[Range]

0 ≦ X ≦ 203, 0 ≦ Y ≦ 203

[Function]

The basic calculation pitch in the horizontal direction is (1/X) inch; the basic calculation pitch in the vertical direction is (1/Y) inch.

Returns to the initial value (X=203, Y=203) when x is 0 and y is 0.

[Notes]

Even if this command is executed, the other settings used currently are not changed. That is, the other set data are changed only when the corresponding setting is made after the basic line feed pitch is changed.

The result of calculation combined with other commands for paper feed amount setting, etc. is corrected with the minimum pitch (1/203) and the remainder is discarded.

[Default]

X = Y = 203

[Reference]

ESC SP: Set character right-side spacing

ESC $: Set absolute position

ESC 3: Set line feed amount

ESC J: Print and feed paper

ESC \: Set relative position

GS V: Cut paper

No.	COMMAND	FUNCTION	CODE
58	1) GS V m 2) GS V m n	Cut paper	<1Dh><56h>

[Range]

1) 0 ≦ m ≦ 1, 48 ≦ m ≦ 49

2) 65 ≦ m ≦ 66, 0 ≦ n ≦ 255

[Function]

Executes a cut of the paper as specified by "m".

1) m = 0, m = 48: Full cut

   m = 1, m = 49: Partial cut

2) m = 65 :

   Paper feed for (cut position+[n×(basic calculation pitch)]) and full cut

   m = 66 :

   Paper feed for (cut position+[n×(basic calculation pitch)]) and partial cut

[Notes]

1) is the same as ESC i / ESC m.

In case of 2), the paper is cut after being fed to the cut position when "n" is 0, and is cut after being fed to the position of (cut position+[n×(basic calculation pitch)]) when "n" is not 0.

Causion:

After this command is executed, You had better execute one line feed or one line print to prevent the Paper Jam.

[Reference]

ESC i: Full cut

ESC m: Partial cut

No.	COMMAND	FUNCTION	CODE
59	GS a n	Enable/disable automatic status transmission	<1Dh><61h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects which status is to be covered by automatic status transmission.

The meaning of each bit of "n" is as follows.

bit	Status to be covered by automatic status transmission	
0	Drawer status	1: Enabled 0: Disabled
1	Online/Offline	1: Enabled 0: Disabled
2	Error state	1: Enabled 0: Disabled
3	Paper detector	1: Enabled 0: Disabled
4	Not defined	
5	Not defined	
6	Not defined	
7	Not defined	

If no status is selected, automatic status transmission is disabled.

If at least one status is selected, automatic status transmission is enabled and 4-byte data is transmitted each time the selected status changes.

The data to be transmitted are listed on the next page.

[Notes]

The status is transmitted without checking the DSR signal.

4 bytes are sent continuously when transmitting the status except for XOFF.

[Reference]

DLE EOT: Transmit status in real time

ESC u: Transmit peripheral device status

ESC v: Transmit paper detector status

1st byte (printer information)

bit	Function	Value 0/1
0	Not used	Fixed to 0
1	Not used	Fixed to 1
2	Drawer status "L"/"H"	"L"/"H"
3	Online/Offline state	Online/Offline
4	Not used	Fixed to 1
5	HEAD UP LEVER	Close/Open
6	Paper feed SW	Paper not being fed/Paper being fed
7	Not used	Fixed to 0

2nd byte (error information)

bit	Function	Value 0/1
0	Not defined	
1	Not defined	
2	RS232 receive error	No error caused/Error caused
3	Auto cutter error	No error caused/Error caused
4	Not used Fixed to 1	
5	Unrecoverable printer error	No error caused/Error caused
6	Head temperature rise	No error caused/Error caused
7	Not used	Fixed to 0

3rd byte (paper detector information)

bit	Function	Value 0/1
0	Near end detector	Paper is present/Paper is out
1	Not defined	
2	Journal end detector	Paper is present/Paper is out
3	Receipt end detector	Paper is present/Paper is out
4	Not used	Fixed to 0
5	Not defined	
6	Not defined	
7	Not used	Fixed to 0

4th byte: dummy

[Notes]

When the head up lever of the printer unit is operated, the status (open/close) of the head up lever is transmitted. At that time, the status o open/close may be repeatedly transmitted by chattering and bounce of the head up lever switch. The status of the head up lever is stabilized in max. 40 msec. Therefore, this change in status must be taken into consideration in process designing in the host side.

The following is one of the methods to reject the status change in a short time.

1) After reception of the status, status reception wait is made for 40 msec.
2) When a status is received during the status reception wait, the previous status is disposed and the process is returned to 1).
3) When no status is received during the status reception wait, the status which was received at the last is used for status process.

No.	COMMAND	FUNCTION	CODE
60	GS F n	Select font for HRI character	<1Dh><66h> n

[Range]

0 ≦ n ≦ 1, 48 ≦ n ≦ 49

[Function]

Selects the font for HRI characters used when printing the bar code.

The font selected by "n" is shown below.

n	Font
0, 48	Font A
1, 49	Font B

[Default]

n = 0

[Reference]

GS H

No.	COMMAND	FUNCTION	CODE
61	GS h n	Select height of bar code	<1Dh><68h> n

[Range]

0 ≦ n ≦ 255

[Function]

Selects the height of bar code.

"n" specifies the number of dots in the vertical direction. [Default]

[Default]

n = 162

No.	COMMAND	FUNCTION	CODE
62	1) GS k m [data] k NUL 2) GS k m n [data] k	Print bar code	<1Dh><6Bh> n

[Range]

① 0 ≦ m 6, 1 ≦ k ≦ 255, 32 ≦ data ≦ 126

② 65 ≦ m ≦ 73, 1 ≦ k ≦ 255, 0 ≦ data ≦ 255

[Function]

Selects the bar code system specified by "m" and prints the bar code.

m		Bar code system	Number of bar code data	Range of DATA
①	0	UPC-A	Fixed (11 ≦ k ≦ 12)	48 ≦ data ≦ 57
	1	UPC-E	Fixed (11 ≦ k ≦ 12)	48 ≦ data ≦ 57
	2	EAN-13	Fixed (12 ≦ k ≦ 13)	48 ≦ data ≦ 57
	3	EAN-8	Fixed (7 ≦ k ≦ 8)	48 ≦ data ≦ 57
	4	CODE39	Variable	48 ≦ data ≦ 57, 65 ≦ data ≦ 90 32, 36, 37, 43, 45, 46, 47 data1=data2=42*1 (startcode/endcode)
	5	Interleaved 2 of 5 (ITF)	Variable (must be an even number)	48 ≦ data ≦ 57
	6	CODEBAR (NW-7)	Variable	65 ≦ data 1 ≦ 68 *2 48 ≦ data ≦ 57, 36, 43, 45, 46, 47, 58
②	65	UPC-A	Fixed (11 ≦ k ≦ 12)	48 ≦ data ≦ 57
	66	UPC-E	Fixed (11 ≦ k ≦ 12)	48 ≦ data≦ 57
	67	EAN-13	Fixed (12 ≦ k ≦ 13)	48 ≦ data ≦ 57
	68	EAN-8	Fixed (7 ≦ k ≦ 8)	48 ≦ data ≦ 57
	69	CODE39	Variable	48 ≦ data ≦ 57,65 ≦ data ≦ 90 32, 36, 37, 43, 45, 46, 47 data1=data 2=42*1 (startcode/endcode)
	70	Interleaved 2 of 5 (ITF)	Variable (must be an even number)	48 ≦ data ≦ 57
	71	CODEBAR (NW-7)	Variable	65 ≦ data 1 ≦ 68 *2 48 ≦ data ≦ 57, 36, 43, 45, 46 47, 58
	72	CODE93	Variable	0 ≦ data ≦ 127
	73	CODE128	Variable	0 ≦ data ≦ 127

*1: Start/stop code omissible

*2: Start code,Stop code

Command of ①: Ends with [00] code. "data" indicates the character code to be printed and "k" indicates the number of characters to be printed.

Command of ②: [n] indicates the number of bar code data and "n" bytes are processed as bar code data starting from the next data. "k" indicates the number of characters to be printed.

[Notes]

Common to ① and ②

In each bar code system, if a code cannot be printed, the printer prints the processed data and the following data is treated as normal data.
Bar code printing is inhibited during printing.

In case of ①

The bar code data of "Interleaved 2 of 5 (ITF)" must be an even number. If an odd number is entered, character "0" is automatically added to the beginning.

In case of ②

The bar code data of "Interleaved 2 of 5 (ITF)" must be an even number. If an odd number is entered, the command is ignored.

CODE93 bar code

Start character (□) is printed at the beginning of the HRI character string.

Stop character (□) is printed at the end of the HRI character string.

The HRI character of control character is composed of ■ and one alphabetic character.

Control character			
ASCII	Hexadecimal	Decimal	HRI character
NUL	00	00	■U
SOH	01	01	■A
STX	02	02	■B
ETX	03	03	■C
EOT	04	04	■D
ENQ	05	05	■E
ACK	06	06	■F
BEL	07	07	■G
BS	08	08	■H
HT	09	09	■I
LF	0A	10	■J
VT	0B	11	■K
FF	0C	12	■L
CR	0D	13	■M
SO	0E	14	■N
SI	0F	15	■O
DLE	10	16	■P
DC1	11	17	■Q
DC2	12	18	■R
DC3	13	19	■S
DC4	14	20	■T
NAK	15	21	■U
SYN	16	22	■V
ETB	17	23	■W
CAN	18	24	■X
EM	19	25	■Y
SUB	1A	26	■Z
ESC	1B	27	■A
FS	1C	28	■B
GS	1D	29	■C
RS	1E	30	■D
US	1F	31	■E
DEL	7F	127	■T

CODE128 bar code

CODE128, which is made by encoding full ASCII 128 characters, represents different things by using three start codes which are functions.

CODE A: Able to represent ASCII characters 00H through 5FH.
CODE B: Able to represent ASCII characters 20H through 7FH.
CODE C: Represents 2-digit numbers (00-99) with one character.

① The start character (CODE A/CODE B/CODE C) must be selected at the beginning of the bar code data.

② The special character is specified by "{" plus one character. ASCII character "{" itself is specified by sending two characters "{" successively.

Special character	Transmit data		
	ASCII	Hexadecimal	Decimal
SHIFT	{S	7B, 53	123, 83
CODE A	{A	7B, 41	123, 65
CODE B	{B	7B, 42	123, 66
CODE C	{C	7B, 43	123, 67
FNC1	{1	7B, 31	123, 49
FNC2	{2	7B, 32	123, 50
FNC3	{3	7B, 33	123, 51
FNC4	{4	7B, 34	123, 52
{	{{	7B, 7B	123, 123

The HRI characters of SHIFT / CODE A, B, C / FNC 1, 2, 3 are not printed.

Characters which can be printed using CODE A

Character	Transmit data	
	Hexadecimal	Decimal
NUL	00	0
SOH	01	1
STX	02	2
ETX	03	3
EOT	04	4
ENQ	05	5
ACK	06	6
BEL	07	7
BS	08	8
HT	09	9
LF	0A	10
VT	0B	11
FF	0C	12
CR	0D	13
SO	0E	14
SI	0F	15
DLE	10	16
DC1	11	17
DC2	12	18
DC3	13	19
DC4	14	20
NAK	15	21
SYN	16	22
ETB	17	23
CAN	18	24
EM	19	25
SUB	1A	26
ESC	1B	27
FS	1C	28
GS	1D	29
RS	1E	30
US	1F	31
SP	20	32
!	21	33
"	22	34

Character	Transmit data	
	Hexadecimal	Decimal
#	23	35
$	24	36
%	25	37
&	26	38
'	27	39
(	28	40
)	29	41
*	2A	42
+	2B	43
,	2C	44
-	2D	45
.	2E	46
/	2F	47
0	30	48
1	31	49
2	32	50
3	33	51
4	34	52
5	35	53
6	36	54
7	37	55
8	38	56
9	39	57
:	3A	58
;	3B	59
<	3C	60
=	3D	61
>	3E	62
?	3F	63
@	40	64
A	41	65
B	42	66
C	43	67
D	44	68
E	45	69

Character	Transmit data	
	Hexadecimal	Decimal
F	46	70
G	47	71
H	48	72
I	49	73
J	4A	74
K	4B	75
L	4C	76
M	4D	77
N	4E	78
O	4F	79
P	50	80
Q	51	81
R	52	82
S	53	83
T	54	84
U	55	85
V	56	86
W	57	87
X	58	88
Y	59	89
Z	5A	90
[	5B	91
\	5C	92
]	5D	93
~	5E	94
_	5F	95
FNC1	7B, 31	123, 49
FNC2	7B, 32	123, 50
FNC3	7B, 33	123, 51
FNC4	7B, 34	123, 52
SHIFT	7B, 53	123, 83
CODE B	7B, 42	123, 66
CODE C	7B, 43	123, 67

Characters which can be printed using CODE B

Character	Transmit data	
	Hexadecimal	Decimal
SP	20	32
!	21	33
"	22	34
#	23	35
$	24	36
%	25	37
&	26	38
'	27	39
(	28	40
)	29	41
*	2A	42
+	2B	43
,	2C	44
-	2D	45
.	2E	46
/	2F	47
0	30	48
1	31	49
2	32	50
3	33	51
4	34	52
5	35	53
6	36	54
7	37	55
8	38	56
9	39	57
:	3A	58
;	3B	59
<	3C	60
=	3D	61
>	3E	62
?	3F	63
@	40	60
A	41	61
B	42	66

Character	Transmit data	
	Hexadecimal	Decimal
C	43	67
D	44	68
E	45	69
F	46	70
G	47	71
H	48	72
I	49	73
J	4A	74
K	4B	75
L	4C	76
M	4D	77
N	4E	78
O	4F	79
P	50	80
Q	51	81
R	52	82
S	53	83
T	54	84
U	55	85
V	56	86
W	57	87
X	58	88
Y	59	89
Z	5A	90
[	5B	91
\	5C	92
]	5D	93
~	5E	94
_	5F	95
`	60	96
a	61	97
b	62	98
c	63	99
d	64	100
e	65	101

Character	Transmit data	
	Hexadecimal	Decimal
f	66	102
g	67	103
h	68	104
i	69	105
j	6A	106
k	6B	107
l	6C	108
m	6D	109
n	6E	110
o	6F	111
p	70	112
q	71	113
r	72	114
s	73	115
t	74	116
u	75	117
v	76	118
w	77	119
x	78	120
y	79	121
z	7A	122
{	7B, 7B	123, 123
|	7C	124
}	7D	125
—	7E	126
DEL	7F	127
FNC1	7B, 31	123, 49
FNC2	7B, 32	123, 50
FNC3	7B, 33	123, 51
FNC4	7B, 34	123, 52
SHIFT	7B, 53	123, 83
CODE A	7B, 41	123, 65
CODE C	7B, 43	123, 67

Characters which can be printed using CODE C

Character	Transmit data	
	Hexadecimal	Decimal
00	00	0
01	01	1
02	02	2
03	03	3
04	04	4
05	05	5
06	06	6
07	07	7
08	08	8
09	09	9
10	0A	10
11	0B	11
12	0C	12
13	0D	13
14	0E	14
15	0F	15
16	10	16
17	11	17
18	12	18
19	13	19
20	14	20
21	15	21
22	16	22
23	17	23
24	18	24
25	19	25
26	1A	26
27	1B	27
28	1C	28
29	1D	29
30	1E	30
31	1F	31
32	20	32
33	21	33
34	22	34

Character	Transmit data	
	Hexadecimal	Decimal
35	23	35
36	24	36
37	25	37
38	26	38
39	27	39
40	28	40
41	29	41
42	2A	42
43	2B	43
44	2C	44
45	2D	45
46	2E	46
47	2F	47
48	30	48
49	31	49
50	32	50
51	33	51
52	34	52
53	35	53
54	36	54
55	37	55
56	38	56
57	39	57
58	3A	58
59	3B	59
60	3C	60
61	3D	61
62	3E	62
63	3F	63
64	40	64
65	41	65
66	42	66
67	43	67
68	44	68
69	45	69

Character	Transmit data	
	Hexadecimal	Decimal
70	46	70
71	47	71
72	48	72
73	49	73
74	4A	74
75	4B	75
76	4C	76
77	4D	77
78	4E	78
79	4F	79
80	50	80
81	51	81
82	52	82
83	53	83
84	54	84
85	55	85
86	56	86
87	57	87
88	58	88
89	59	89
90	5A	90
91	5B	91
92	5C	92
93	5D	93
94	5E	94
95	5F	95
96	60	96
97	61	97
98	62	98
99	63	99
FNC1	7B, 31	123, 49
CODE A	7B, 41	123, 65
CODE B	7B, 42	123,66

No.	COMMAND	FUNCTION	CODE
63	GS r n	Transmit status	<1Dh><72h> n

[Range]

0 ≦ n ≦ 2

49 ≦ n ≦ 50

[Function]

Selects which status is to be covered by automatic status transmission.

The meaning of each bit of "n" is as follows.

n	Function
1, 49	Transmits paper detector status. (Same as ESC v)
2, 50	Transmits drawer status. (Same as ESC u 0)

The data to be transmitted are listed on the next page.

[Notes]

When DTR/DSR control is selected, the status is transmitted after the printer confirms that the host computer is ready to receive data (DSR signal is ON). If the host computer is not ready to receive data (DSR signal is OFF), the printer waits until the computer is ready.

When XON/XOFF control is selected, one byte is transmitted without checking if is ready to receive data.

This command is executed during receive buffer expansion. Therefore, if there is other data in the receive buffer, some delay may be caused between command receiving and status transmitting.

[Reference]

DLE EOT: Transmit status in real time

ESC u: Transmit peripheral device status

ESC v: Transmit paper detector status

n=1,49: Paper detector status

bit	Function	Value 0/1
0	Near end detector	Paper is present/Paper is out
1	Not defined	
2	Journal end detector	Paper is present/Paper is out
3	Receipt end detector	Paper is present/Paper is out
4	Not used	Fixed to 0
5	Not defined	
6	Not defined	
7	Not used	Fixed to 0

n=2,50: Drawer status

bit	Status	0/1
0	Drawer	Open/Close
1	Not defined	
2	Not defined	
3	Not defined	
4	Fixed to 0	
5	Not defined	
6	Not defined	
7	Fixed to 0	

No	COMMAND	FUNCTION	CODE
64	GS w n	Select horizontal size	<1Dh><77h>

[Range]

2 ≦ n ≦ 6

[Function]

Selects the horizontal size (magnification) of the bar code."n" specifies the number of dots in one module.

[Default]

n=0

CHAPTER 5. CHARACTER DESCRIPTION

①

	HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
HEX	BIN	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL 00	DLE 16	SPACE 32	0 48	@ 64	P 80	‘ 96	p 112	Ç 128	È 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	SOH 01	XON 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	0010	STX 02	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≧ 242
3	0011	ETX 03	XOF 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≦ 243
4	0100	EOT 04	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	ENQ 05	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	ACK 06	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	a 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	0111	BEL 07	ETB 23	‘ 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	O 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	BS 08	CAN 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	HT 09	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	· 249
A	1010	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	■ 219	δ 235	√ 251
C	1100	FF 12	FS 28	’ 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	1101	CR 13	GS 29	— 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	1110	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	SPACE 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SPACE 255

② Page1 (JAPAN:Katakana)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	128	144	SPACE 160	176	192	208	224	240
1	0001	129	145	161	177	193	209	225	241
2	0010	130	146	162	178	194	210	226	242
3	0011	131	147	163	179	195	211	227	243
4	0100	132	148	164	180	196	212	228	244
5	0101	133	149	165	181	197	213	229	245
6	0110	134	150	166	182	198	214	230	246
7	0111	135	151	167	183	199	215	231	247
8	1000	136	152	168	184	200	216	232	248
9	1001	137	153	169	185	201	217	233	249
A	1010	138	154	170	186	202	218	234	250
B	1011	139	155	171	187	203	219	235	251
C	1100	140	156	172	188	204	220	236	252
D	1101	141	157	173	189	205	221	237	253
E	1110	142	158	174	190	206	222	238	254
F	1111	143	159	175	191	207	223	239	SPACE 255

③ Page2

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	Ó 224	– 240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	0010	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	= 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	0100	ä 132	õ 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	0101	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	0110	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	Þ 231	, 247
8	1000	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	þ 232	° 248
9	1001	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	1010	è 138	Ü 154	¬ 70	║ 186	╩ 202	┌ 218	Û 234	· 250
B	1011	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▮ 219	Ù 235	1 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	y 236	3 252
D	1101	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Y 237	2 253
E	1110	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	1111	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▪ 223	' 239	SPACE 255

④ Page3

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	À 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	0010	é 130	È 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	Á 134	ù 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	Ê 137	Õ 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	∙ 249
A	1010	è 138	Ü 154	¬ 70	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	Í 139	¢ 155	½ 171	╗ 187	╦ 203	■ 219	δ 235	√ 251
C	1100	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	∞ 236	n 252
D	1101	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	1110	Ã 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SPACE 255

⑤ Page4

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	¦ 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	È 145	' 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	0010	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≧ 242
3	0011	â 131	ô 147	ú 163	| 179	├ 195	╙ 211	π 227	≦ 243
4	0100	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	Ï 149	. 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	¶ 134	û 150	3 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	0111	ç 135	ù 151	― 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	. 248
9	1001	ë 137	Õ 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	. 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▮ 219	δ 235	√ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	∞ 236	n 252
D	1101	= 141	Ù 157	¾ 173	╜ 189	═ 205	▮ 221	φ 237	2 253
E	1110	À 142	Û 158	« 174	╛ 190	╬ 206	▮ 222	∈ 238	▪ 254
F	1111	§ 143	f 159	» 175	┐ 191	╧ 207	▪ 223	∩ 239	SPACE 255

⑥ Page5

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	0010	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	ë 137	Ö 153	⌐ 69	╣ 185	╔ 201	┘ 217	θ 233	· 249
A	1010	è 138	Ü 154	¬ 70	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	ø 155	½ 171	╗ 187	╦ 203	■ 219	δ 235	√ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	∞ 236	n 252
D	1101	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	1110	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	SPACE 255

⑦ Page6 (GREECE)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	Í 144	ΐ 160	▒ 176	└ 192	Τ 208	ζ 224	– 240
1	0001	ü 129	Ï 145	΄ 161	▓ 177	┴ 193	Υ 209	η 225	± 241
2	0010	é 130	Ó 146	ό 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	0011	â 131	ô 147	ύ 163	│ 179	├ 195	Χ 211	ι 227	φ 243
4	0100	ã 132	ö 148	Α 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	0101	à 133	Ύ 149	Β 165	Κ 181	┼ 197	Ω 213	λ 229	§ 245
6	0110	Á 134	Ϋ 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	0111	ç 135	© 151	Δ 167	Μ 183	Ρ 199	β 215	ν 231	΄ 247
8	1000	· 136	Ω 152	Ε 168	Ν 184	╚ 200	γ 216	ξ 232	° 248
9	1001	¬ 137	2 153	Ζ 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	1010	¦ 138	3 154	Η 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	1011	' 139	ά 155	½ 171	╗ 187	╦ 203	▮ 219	ρ 235	ϋ 251
C	1100	' 140	£ 156	Θ 172	╝ 188	╠ 204	▪ 220	σ 236	ΰ 252
D	1101	É 141	έ 157	Ι 173	Ξ 189	═ 205	δ 221	ς 237	ώ 253
E	1110	― 142	ή 158	« 174	Ο 190	╬ 206	ε 222	τ 238	■ 254
F	1111	Ή 143	ί 159	» 175	┐ 191	Σ 207	▪ 223	΄ 239	SPACE 255

⑧ Page7 (SLAV)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	đ 208	Ó 224	— 240
1	0001	ü 129	Ł 145	í 161	▓ 177	┴ 193	Đ 209	ß 225	¨ 241
2	0010	é 130	Í 146	ó 162	▓ 178	┬ 194	Ď 210	Ô 226	˛ 242
3	0011	â 131	ő 147	ú 163	│ 179	├ 195	Ë 211	Ń 227	ˇ 243
4	0100	ă 132	ö 148	Ą 164	┤ 180	─ 196	ď 212	ń 228	˘ 244
5	0101	ů 133	Ľ 149	ą 165	Á 181	┼ 197	Ň 213	ň 229	§ 245
6	0110	ć 134	ľ 150	Ž 166	Â 182	Ă 198	Í 214	Š 230	÷ 246
7	0111	ç 135	Ś 151	ž 167	Ě 183	ă 199	Î 215	š 231	˙ 247
8	1000	ł 136	ś 152	Ę 168	Ş 184	╚ 200	ě 216	Ŕ 232	° 248
9	1001	ë 137	Ő 153	ę 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	1010	Ő 138	Ű 154	¬ 170	║ 186	╩ 202	┌ 218	ŕ 234	• 250
B	1011	ő 139	Ť 155	ź 171	╗ 187	╦ 203	▮ 219	Ű 235	ű 251
C	1100	î 140	ť 156	č 172	╝ 188	╠ 204	▪ 220	ý 236	Ř 252
D	1101	Z 141	Ł 157	ş 173	Ż 189	═ 205	Ţ 221	Ý 237	ř 253
E	1110	Ä 142	X 158	« 174	ż 190	╬ 206	Ů 222	ţ 238	■ 254
F	1111	Ć 143	Č 159	» 175	┐ 191	¤ 207	▪ 223	´ 239	SPACE 255

⑨ Page254

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	Õ 176	└ 192	ř 208	↑ 224	↑ 240
1	0001	ü 129	æ 145	í 161	Ú 177	┴ 193	ž 209	β 225	↓ 241
2	0010	é 130	Æ 146	ó 162	õ 178	┬ 194	ů 210	Γ 226	→ 242
3	0011	â 131	ô 147	ú 163	| 179	ģ 195	ç 211	π 227	← 243
4	0100	ä 132	ö 148	ñ 164	ú 180	─ 196	ī 212	Σ 228	!! 244
5	0101	à 133	ò 149	Ñ 165	Ā 181	ķ 197	Ġ 213	Λ 229	§ 245
6	0110	å 134	û 150	Í 166	Ē 182	ļ 198	Ş 214	Ψ 230	∞ 246
7	0111	ç 135	ù 151	Ó 167	ī 183	ņ 199	Đ 215	Δ 231	∞ 247
8	1000	ê 136	Á 152	¿ 168	Ū 184	Č 200	đ 216	Φ 232	° 248
9	1001	Þ 137	Ō 153	⌐ 169	ā 185	Š 201	┘ 217	θ 233	¨ 249
A	1010	è 138	Ŭ 154	¬ 170	ē 186	ž 202	┌ 218	Ω 234	· 250
B	1011	ý 139	¢ 155	½ 171	ī 187	ă 203	▮ 219	Ξ 235	˘ 251
C	1100	î 140	£ 156	Ú 172	ū 188	č 204	▪ 220	ϒ 236	° 252
D	1101	ì 141	¥ 157	¡ 173	Ģ 189	ě 205	□ 221	φ 237	Ć 253
E	1110	Ä 142	Pt 158	◄ 174	Ķ 190	ň 206	▵ 222	Φ 238	ć 254
F	1111	Å 143	⊟ 159	► 175	!! 191	š 207	▿ 223	' 239	SPACE 255

Page254

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SPACE 128	SPACE 144	SPACE 160	SPACE 176	SPACE 192	SPACE 208	SPACE 224	SPACE 240
1	0001	SPACE 129	SPACE 145	SPACE 161	SPACE 177	SPACE 193	SPACE 209	SPACE 225	SPACE 241
2	0010	SPACE 130	SPACE 146	SPACE 162	SPACE 178	SPACE 194	SPACE 210	SPACE 226	SPACE 242
3	0011	SPACE 131	SPACE 147	SPACE 163	SPACE 179	SPACE 195	SPACE 211	SPACE 227	SPACE 243
4	0100	SPACE 132	SPACE 148	SPACE 164	SPACE 180	SPACE 196	SPACE 212	SPACE 228	SPACE 244
5	0101	SPACE 133	SPACE 149	SPACE 165	SPACE 181	SPACE 197	SPACE 213	SPACE 229	SPACE 245
6	0110	SPACE 134	SPACE 150	SPACE 166	SPACE 182	SPACE 198	SPACE 214	SPACE 230	SPACE 246
7	0111	SPACE 135	SPACE 151	SPACE 167	SPACE 183	SPACE 199	SPACE 215	SPACE 231	SPACE 247
8	1000	SPACE 136	SPACE 152	SPACE 168	SPACE 184	SPACE 200	SPACE 216	SPACE 232	SPACE 248
9	1001	SPACE 137	SPACE 153	SPACE 169	SPACE 185	SPACE 201	SPACE 217	SPACE 233	SPACE 249
A	1010	SPACE 138	SPACE 154	SPACE 170	SPACE 186	SPACE 202	SPACE 218	SPACE 234	SPACE 250
B	1011	SPACE 139	SPACE 155	SPACE 171	SPACE 187	SPACE 203	SPACE 219	SPACE 235	SPACE 251
C	1100	SPACE 140	SPACE 156	SPACE 172	SPACE 188	SPACE 204	SPACE 220	SPACE 236	SPACE 252
D	1101	SPACE 141	SPACE 157	SPACE 173	SPACE 189	SPACE 205	SPACE 221	SPACE 237	SPACE 253
E	1110	SPACE 142	SPACE 158	SPACE 174	SPACE 190	SPACE 206	SPACE 222	SPACE 238	SPACE 254
F	1111	SPACE 143	SPACE 159	SPACE 175	SPACE 191	SPACE 207	SPACE 223	SPACE 239	SPACE 255

⑪ International character set

Country	HEX / DEC	23 / 35	24 / 36	40 / 64	5B / 91	5C / 92	5D / 93	5E / 94	60 / 96	7B / 123	7C / 125	7D / 125	7E / 126
0 U.S.A.		#	$	@	[	\	]	^	`	{	¦	}	~
1 France		#	$	à	°	ç	§	^	`	é	ù	è	¨
2 Germany		#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3 U.K.		£	$	@	[	\	]	^	`	{	¦	}	~
4 Denmark I		#	$	@	Æ	Ø	Å	^	`	æ	Ø	å	~
5 Sweden		#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6 Italy		#	$	@	°	\	é	^	ù	à	ò	è	ì
7 Spain		Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
8 Japan		#	$	@	[	\	]	^	`	{	¦	}	~
9 Norway		#	¤	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü
10 Denmark II		#	$	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü

CHAPTER 6. HEXADECIMAL DUMP

This function is intended to print the data sent from the host computer, using hexadecimal digits and characters corresponding to them.

This function is started by turning ON the power while pressing the R key and ended by turning OFF the power.

Example of hexadecimal print

```
12345678901234567890123456789O
Hexadecimal Dump

1B 21 00 1B 26 02 40   .!..&.@
1B 21 04 1B 26 02 40   .!..&.@
```

One line of data (7 units) is printed when received.

If the print data is less than one line, it is printed offline.

No functions other than [DLE][EOT] / [DLE][ENQ] operate during the hexadecimal dump.

After performing the hexadecimal dump, the processing before it is not resumed and MASTER RESET is made automatically.

CHAPTER. 7 :ERROR HANDRING

1. Error table

The following error states may be caused.

Error description	Operating method in case of error detection
Auto cutter error	Motor lock error described below is caused. When status request is made, auto cutter error is returned.
Head temperature rise error	Motor lock error described below is caused. When status request is made, head temperature rise error is returned.
Thermal head thermistor's breakdown	Motor lock error described below is caused. When status request is made, unrecoverable printer error is returned.
No thermal head connection	Motor lock error described below is caused. When status request is made, unrecoverable printer error is returned.
Head up error	Motor lock error described below is caused. When status request is made, head up lever open is returned.
Paper detector error	If paper-out error is detected by the detector selected with ESC c 4, motor lock error is caused. When status request is made, paper-out error of each detector is returned.
Data receive error	If the following errors occur while data is being received through RS232, ? is printed when bit 2 of dip switch 2 is so set as to print ?. • Parity error • Framing error • Overrun error
Buffer full error	If print data is still received After completion of data processing of one line, printing of one line is performed automatically.

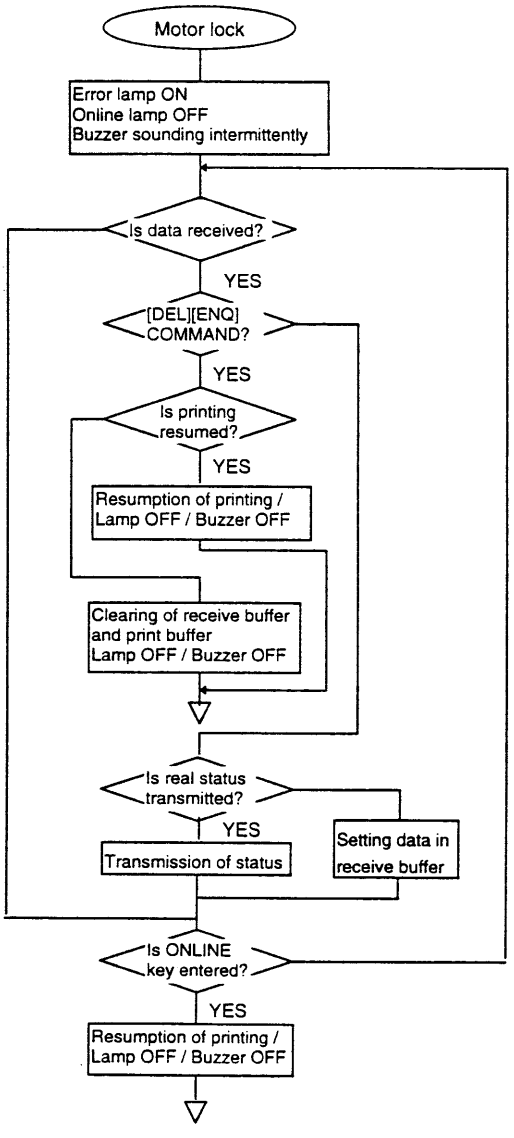
2. Motor Lock

If the motor lock is caused, the following operations are performed.

1) The error lamp goes on, the online lamp goes off and the buzzer sounds intermittently.
2) In case of automatic status transmission, the status is transmitted to the host computer via RS232.
3) The cause of error is removed.
4) By pressing the online key and receiving the [DLE][ENQ] command from the host computer, printing is resumed.
   [DLE][ENQ][00]: Restarts printing at the beginning of the line where the error was caused.
   [DLE][ENQ][01]: Recovers from the error after clearing the receive buffer and print buffer.
5) If the motor lock occurs during printing, a power failure mark is printed and the interrupted printing is executed again.
6) After error recovery, the error lamp goes off, the online lamp goes on and the buzzer stops sounding.

The following commands are processed even during motor lock.
[DLE][EOT]/[GS][ENQ]

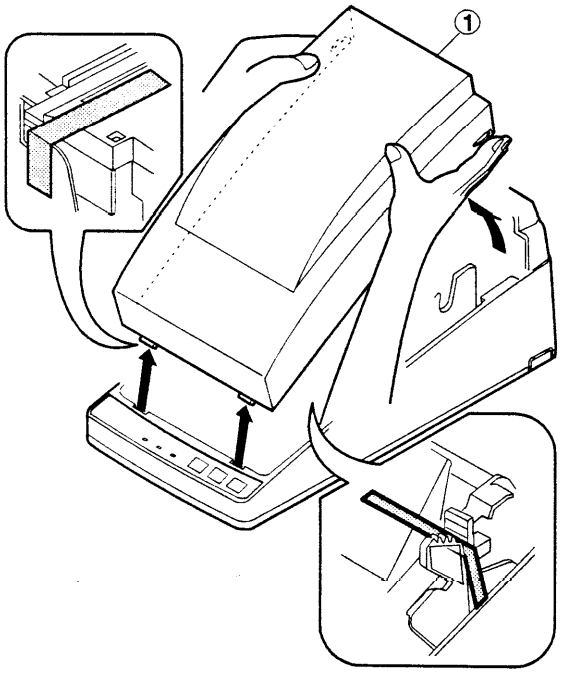
3. Motor lock processing flow chart



CHAPTER 8. DISASSEMBLY & ASSEMBLY

This chapter describes mainly the disassembly procedures. For the assembly procedures, reverse the disassembly procedures.

1. REMOVE THE PR COVER UNIT



[DISASSEMBLY METHOD]

1) Remove the PR COVER UNIT (1).

   There are holding notches at the rear of the both sides of PR COVER UNIT ①.

   Hold the notches and lift the unit.

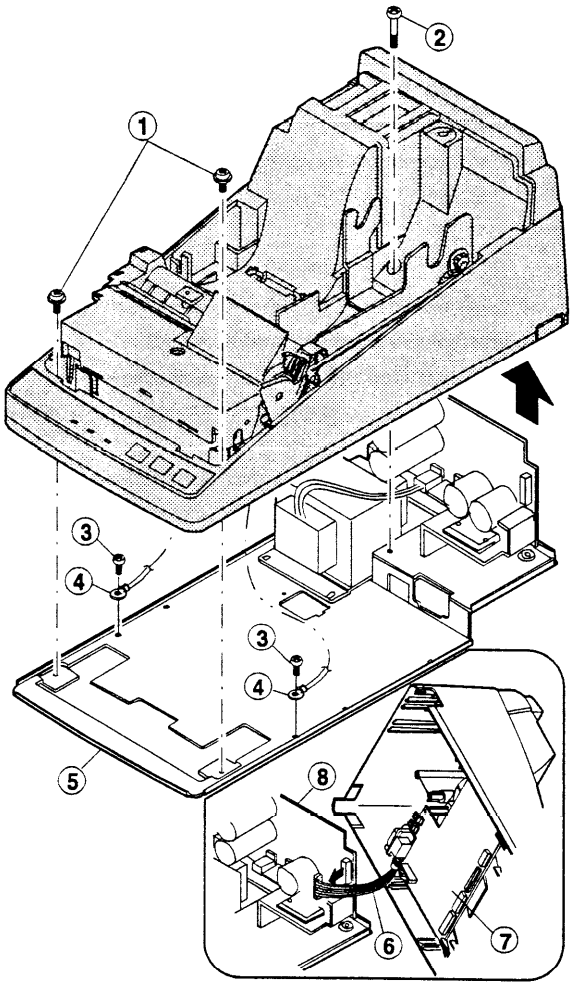
   There are two pawls in the front section.

   * When shipping, transportation tape is attached to the auto cutter section of the printer unit. Remove the tape before use.

[PARTS LIST]

No.	PARTS NAME	Q'TY
①	PR COVER UNIT	1

2. REMOVE THE TOP CABINET



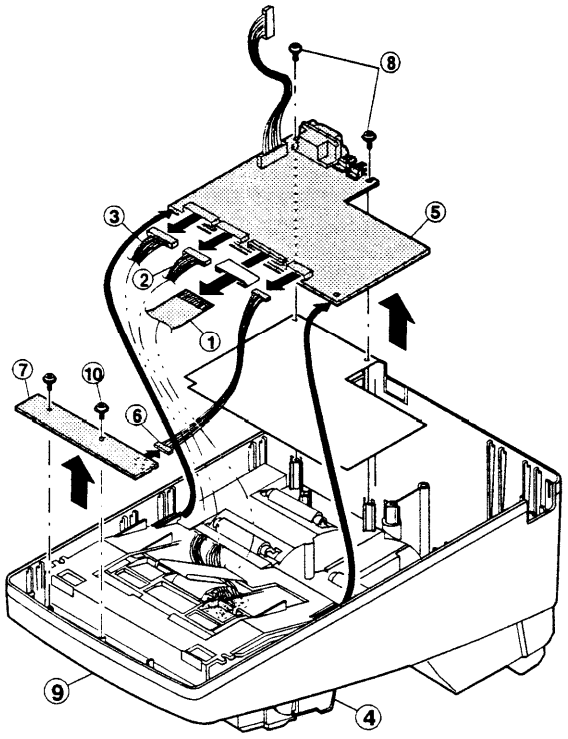
[DISASSEMBLY METHOD]

1) Remove the two SCREWs ①.
2) Remove the SCREW ②.
3) Remove the two SCREWs ③ and remove the EARTH WIREs ④ from the BOTTOM PLATE ⑤.
4) Remove the PS CABLE ⑥ of the CONTROL PWB ⑦ from the N/F PS PWB UNIT ⑧.

[PARTS LIST]

No.	PARTS NAME	Q'TY
①	SCREW (M3 × 8)	2
②	SCREW (M3 × 25)	1
③	SCREW (M3 × 6)	2
④	EARTH WIRE	2
⑤	BOTTOM PLATE	1
⑥	PS CABLE	1
⑦	CONTROL PWB	1
⑧	N/F PS PWB UNIT	1

3. REMOVE THE CONTROL PWB AND PANEL PWB

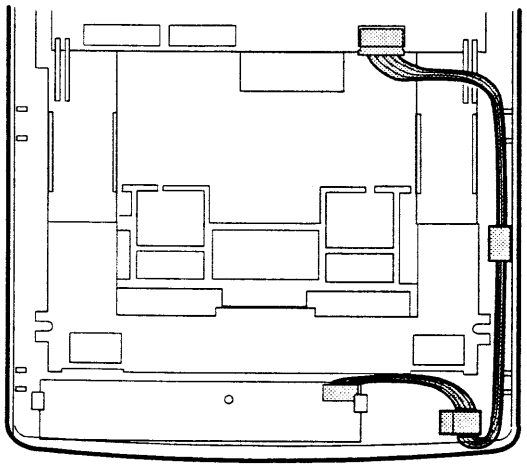


[DISASSEMBLY METHOD]

1) Remove the FLAT CABLE ① of the PRINTER UNIT ④ from the CONTROL PWB ⑤.
2) Remove the PR CABLE ② and ③ of the PRINTER UNIT ④ from the CONTROL PWB ⑤.
3) Remove the two SCREWs ⑩ and remove the PANEL PWB ⑦ from the TOP CABINET ⑨.
4) Remove the PANEL CABLE ⑥ from the CONTROL PWB ⑤ and PANEL PWB ⑦.

[CAUTIONS TO BE TAKEN WHEN REINSTALLING]

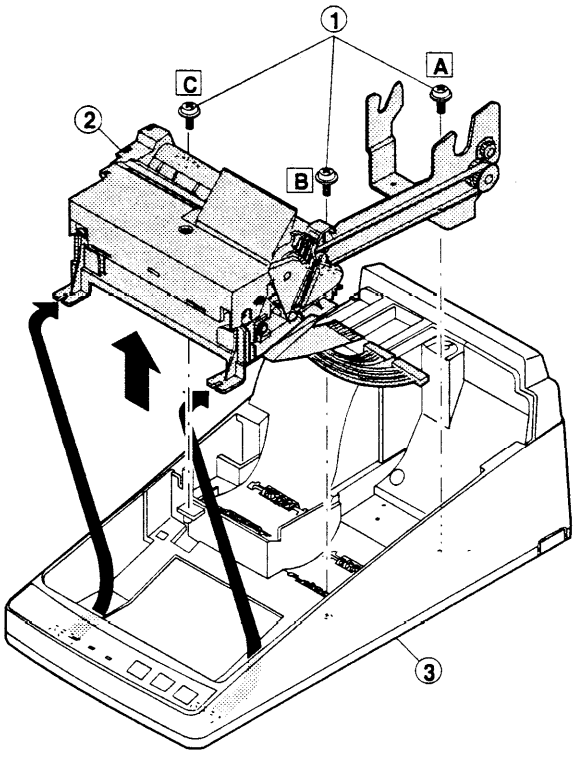
- PANEL CABLE ⑥ wire treatment procedure



[PARTS LIST]

No.	PARTS NAME	Q'TY
①	FLAT CABLE (26P)	1
②	PR CABLE (10P)	1
③	PR CABLE (12P)	1
④	PRINTER UNIT: PR-58L	1
⑤	CONTROL PWB	1
⑥	PANEL CABLE (7P)	1
⑦	PANEL PWB	1
⑧	SCREW (M3 × 8)	2
⑨	TOP CABINET	1
⑩	SCREW (M3 × 6)	2

4. REMOVE THE PRINTER UNIT



[DISASSEMBLY METHOD]

1) Remove the three SCREWs ① and remove the PRINTER UNIT ② from the TOP CABINET ③.

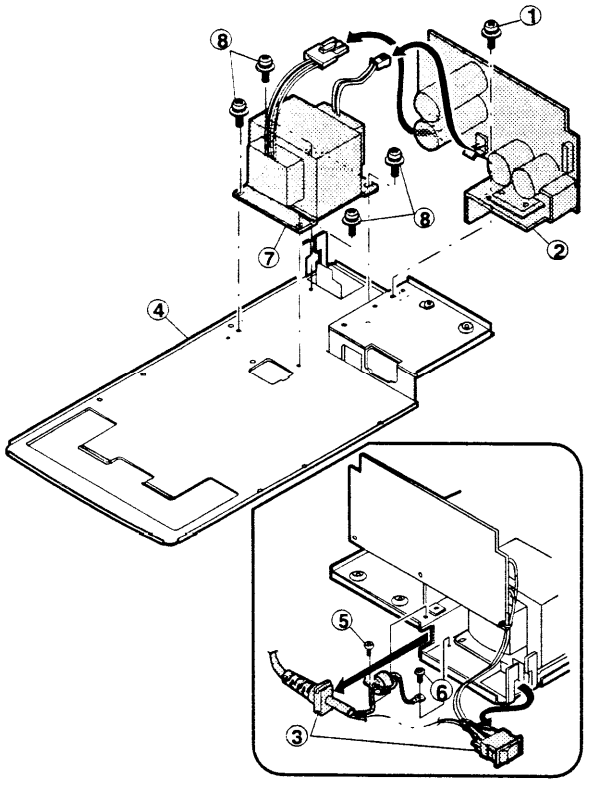
[CAUTIONS TO BE TAKEN WHEN REINSTALLING]

When installing printer unit ②, tighten the SCREWS ① in the sequence of A, B, C as indicated in the figure.

[PARTS LIST]

No.	PARTS NAME	Q'TY
①	SCREW (M3 × 8)	3
②	PRINTER UNIT: PR-58L	1
③	TOP CABINET	1

5. REMOVE THE N/F PS PWB UNIT



[DISASSEMBLY METHOD]

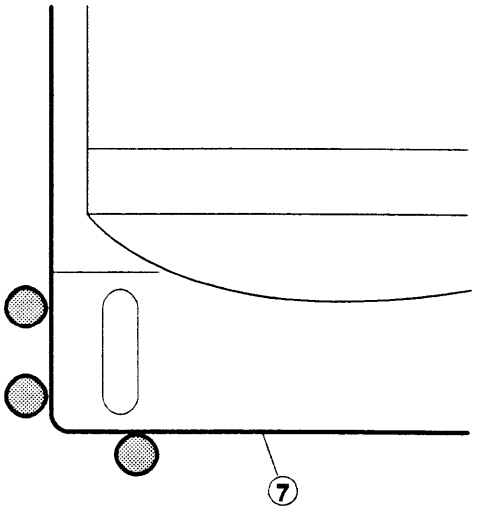
1) Remove the SCREW ① and remove the N/F PS PWB UNIT ② from the BOTTOM PLATE ④.
2) Remove the SCREW ⑤ and ⑥ and remove the AC CORD UNIT ③ from the BOTTOM PLATE ④.
3) Remove the two connector cables of the POWER TRANSFORMER ⑦ from the N/F PS PWB UNIT ②.
4) Remove the four SCREWs ⑧ and remove the POWER TRANSFORMER ⑦ from the BOTTOM PLATE ④.

[PARTS LIST]

No.	PARTS NAME	Q'TY
①	SCREW (M3 × 8)	1
②	N/F PS PWB UNIT	1
③	AC CORD UNIT	1
④	BOTTOM PLATE	1
⑤	SCREW (M3 × 8)	1
⑥	SCREW (M4 × 6)	1
⑦	POWER TRANSFORMER	1
⑧	SCREW (M4 × 8)	4

[CAUTIONS TO BE TAKEN WHEN REINSTALLING]

When installing POWER TRANSFORMER ⑦, fit with the positioning boss of BOTTOM PLATE ④, and tighten the screw.



CHAPTER 9. INSTALLATION OF SERVICE OPTIONS

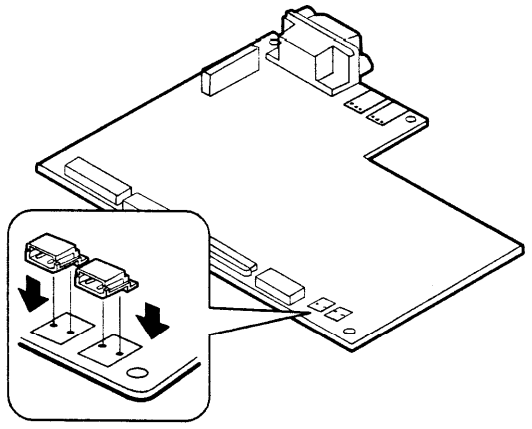
1. Paper near end sensor: DUNT-5800BHZZ

[PARTS LIST]

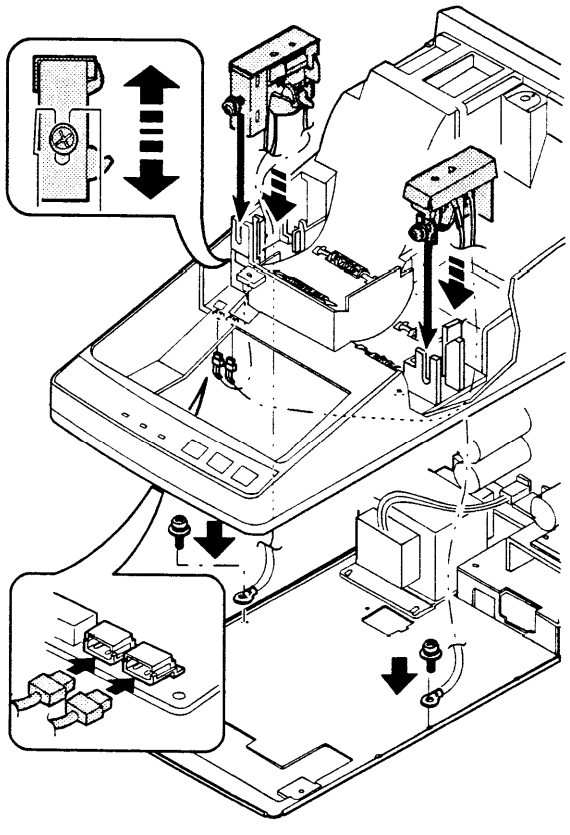
No.	Parts name	Parts code	Q'ty	Price	Note
1	Paper near end sensor unit	DUNT-5800BHZZ	1	AZ	

[DISASSEMBLY METHOD]

1) Remove the PR COVER UNIT.
2) Remove the TOP CABINET.
3) Remove the CONTROL PWB.
4) Solder the accessory connector to the CONTROL PWB.



5) Attach the CONTROL PWB.

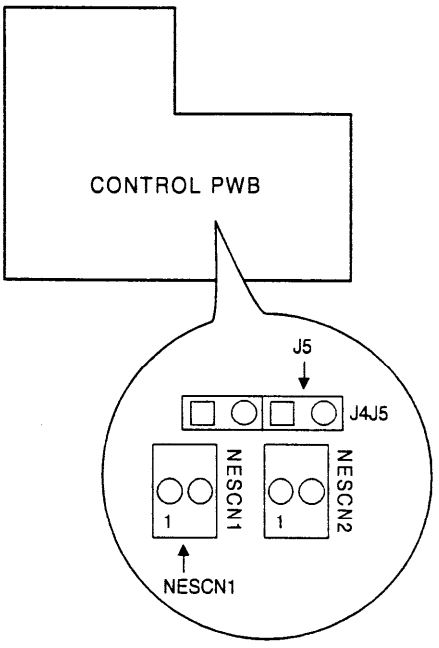


6) Remove the PRINTER UNIT.
7) Install the NEAR END SENSOR UNIT ① to the TOP CABINET ②.

   * Adjust the height of the NEAR END SENSOR UNIT, and fix it with the fixing screw.

8) Install the PRINTER UNIT.
9) Attach the earth wire from the NEAR END SENSOR UNIT ① to the BOTTOM PLATE ③.
10) Attach the connector cable from the NEAR END SENSOR UNIT ① to the connector of the CONTROL PWB.

Note: When attaching the near end sensor either to the receipt side or to the journal side, the connector must be connected to NESC1 on the control PWB and J6 must be shorted by the jumper wire.
When both of the receipt side and the journal side are used, either connector NESC1 or NESC2 can be used and there is no difference in operations.



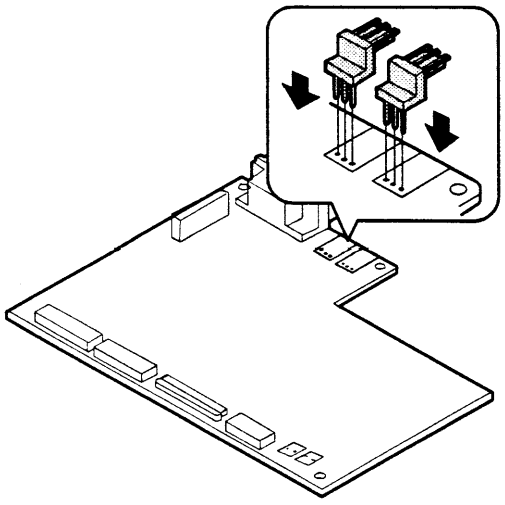
2. Drawer connector: QCNCM5278NCZZ

[PARTS LIST]

No.	Parts name	Parts code	Q'ty	Price	Note
1	Drawer connector	QCNCM5278NCZZ	1	AC	

[DISASSEMBLY METHOD]

1) Remove the PR COVER UNIT.
2) Remove the TOP CABINET.
3) Remove the CONTROL PWB.



4) Solder the accessory connector to the CONTROL PWB.
5) Install the CONTROL PWB.

CHAPTER 10. DIAGNOSTICS FUNCTION

1. General

This chapter describes the diagnostic program installed to the ER-01PU and its operations.

The purpose of this diagnostic program is to check the machine operations in servicing and evaluate the product by continuous operations.

The diagnostic program is started by the command from the host.

Application software for test which is performed in the host PC by the command is available.

This chapter, therefore, describes both the stand-alone operations of the ER-01PU and test application of the host, which are identified as the stand-alone test (ER-01PU stand-alone) and the connection test (host).

The intended host machine is PC-AT or its compatible machines with DOS 6.2. In this chapter.

2. Test program start

2-1. Stand-alone test

(1) Turn off all DIP SW2. (Don't care DIP SW1.)

(2) Press and hold "JF" key and "RF" key together, and turn on the power switch. (Master reset)

(3) Leave the machine for about 30 sec in order to charge the double-layer electric capacity. Then turn off the power switch.

(4) With "JR" key pressed, turn on the power switch. (The machine enters the test mode.)

(5) Turn on the DIP switch corresponding to the test to be executed.

(For setting the DIP switch, refer to "3. Program Code List" on page 10-2.)

(6) Turn on the on-line key to start the test program.

(7) After completion of the test, turn off the power switch and set the DIP switch for shipment.

Shipment setting: DIP SW1/2 = All OFF (No need to change for the connection test.)

(8) After completion of the test, turn off the power switch and return the DIP switch to the original state.

(9) Execute the master reset and cancel the test mode.

Note:

① When the power is turned on, the connection of printer cables 1/2 (RMTEST/JMTEST signal) and of the thermal head cable (RHEAD signal) is tested with the diagnostics program.

* If there is no connection, the buzzer sounds continuously and the test is terminated.

② By master reset, certain data are written into memory and the power is turned off. When the power is turned on afterward, the memory contents are tested. (Back-up state of the double-layer electric capacitor is tested.)

In case of insufficient charging, "###" mark is printed and the machine enters the master reset mode automatically.

③ As the conditions for entering the test mode, set DIP SW1 to DON'T CARE and DIP SW2 to ALL OFF.

If the power is turned on with even a DIP SW2 tab set to ON, "IPL ERR" occurs.

④ To test the all functions of the control PWB, perform the auto test after completion of the DIP switch test.

⑤ The test mode cannot be canceled by turning off the power switch. In order to cancel the test mode, the master reset must be executed.

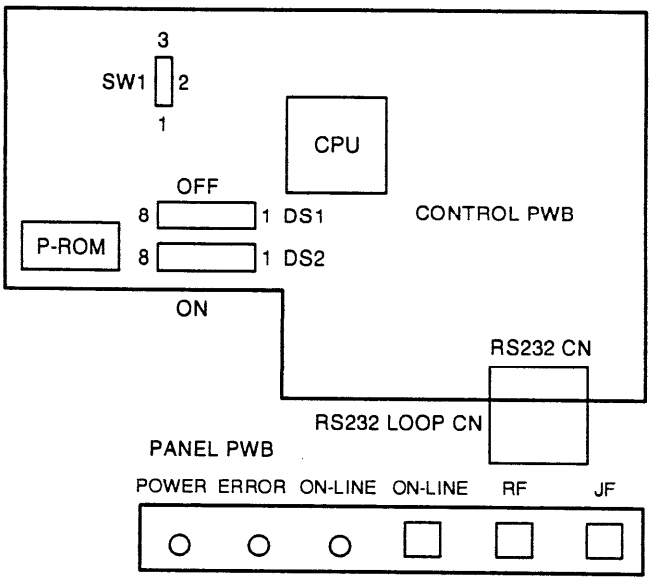


Fig. 1

2-2. Connection test (procedures when the ROM to check the ER-01PU in is used in the ER-01PU)

(1) Connect the ER-01PU's RS232 connector to the RS232 connector on the COM 1 side of the PC with the RS232 cable.

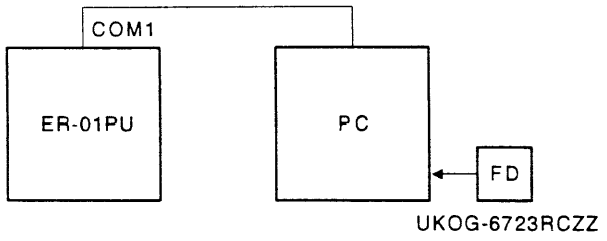


Fig. 2

(2) Turn on the power switch of the PC.

(3) While pressing and holding "JF" key and "RF" key together, turn on the power switch. (Master reset)

(4) To charge the double-layer electric capacitor, lead the machine for about 30 sec. Then turn off the power switch.

(5) With "JF" key of the ER-01PU pressed, turn on the power switch. (The machine enters the test mode.)

(6) Insert the FD which includes the PC diagnostics test program into drive A.
On the prompt of "C>" of the PC, enter "A:\01PUDIAG" and press the enter key, and the diagnostics setting menu is displayed.

(7) On the setting menu of the PC, select the item with the → key and press the ENTER key. (Selection of set item)

Parity select: Even/Odd/[None]

Data rate (bps): 2400/4800/9600/19200/[38400]

(8) After completion of the PC setting, press the ESC key and the ENTER key in this sequence. (The menu is displayed.)

(9) On the menu screen of the PC, select a menu with the → key and press the ENTER key. (Each test is performed.)

(10) To cancel the test item, press the ENTER key of the PC.

(11) To cancel the test mode perform the master reset.

Note:

① The following set items must be common to the ER-01PU DIP switch setting and the PC setting. If not, the operation is not performed properly.
Bit format/Parity select/Data rate
For details, refer to the "DIP switch table."

② The ER-01PU/PC RS232C cables must be as shown below:

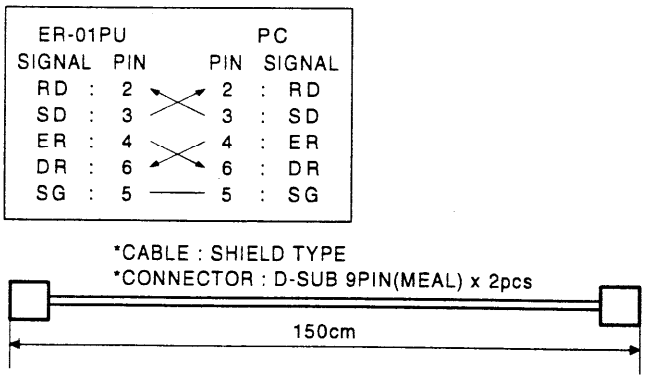


Fig. 4

3. Program code list

(1) ER-01PU stand-alone test

* After turning on the DIP switch, press the "ON-LINE" key to start the test.

(2) Connection test with the host

* Select the test item on the menu screen of the host with the → key, and press the ENTER key to start the test.

Test NO.	Test item (Menu screen)	Stand-alone test	Connection test with host
001	KEY/LAMP/BUZZER Diagnostics (DIP SW ON/OFF Diagnostics)	Included in AUTO. SW1-1	MENU 01 None
002	R/J PRINTER Diagnostics	SW1-2	MENU 02
003	PRINTER CG Diagnostics	SW1-3	MENU 03
004	DRAWER1 OPEN & SENSE Diagnostics	SW1-4	MENU 04
005	DRAWER2 OPEN & SENSE Diagnostics	SW1-5	MENU 05
006	(RS232 LOOP Diagnostics)	SW1-6	None
007	FLASH ROM & CG ROM SUM Diagnostics	SW1-7	MENU 06
008	RAM Diagnostics	SW1-8	MENU 07
009	AUTO Diagnostics	SW1&SW2 ALL ON	MENU 08
010	AGING Diagnostics	SW1 ALL ON SW2 ALL OFF	MENU 09
011	PAPER END/NEAR END/HEAD UP Diagnostics	None	MENU 10
012	A/D CONVERSION Diagnostics	None	MENU 11
013	DIP SW & J1/J2 Diagnostics	Included in AUTO.	MENU 12
Test item cancel	Diagnostics END	Auto end	MENU 17

Note: ( ) in the connection test is not displayed on the menu screen.
Only the aging test is terminated when the power is turned off.
(Either in the stand-alone test or in the connection test.)

4. Test items

4-1A. Key/Lamp/Buzzer test

(1) Operation

* Stand-alone test: None (Included in the auto test)
* Connection test: Test item selection → Press the ENTER key.

(2) Content

1) Every time when JF → RF → ON-LINE key is pressed in this sequence, the buzzer sounds. (short sound 0.5sec for the other tests also.)
2) The ON-LINE lamp and the ERR lamp light up in this sequence for about 0.5sec and go off.
3) After completion, the buzzer sound once.

(3) Check contents

Check the buzzer sound and check visually.

(4) Cancel

After completion of the test, the end print is printed and the operation is terminated.

TEST001:END (End print)

4-1B. DIP switch ON/OFF test

(1) Operation

* Stand-alone test: SW1-1 → ON-LINE key ON
* Connection test: None

(2) Content

1) Set DIP SW1/2 to ALL OFF.
2) Turn on DIP switches one by one in the sequence of SW1-1 ~ SW1-8 SW2-1 ~ SW2-8.
3) If O.K., after completion of SW2-8, the buzzer sounds once and print is made. TEST=001:OK
4) In case of ERR, the buzzer sounds for 3sec. The test is interrupted and print is made. TEST=001:ERR

(3) Check content

Check the buzzer sound and the print.

(4) Cancel

After completion of the above print, the test is terminated.

4-2. R/J printer test

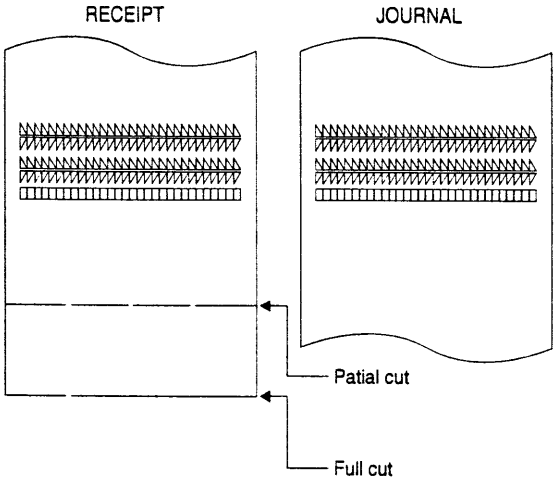
(1) Operation

* Stand-alone test: SW1-2 → ON-LINE key ON
* Connection test: Selection of test item → ENTER key ON

(2) Content

A receipt and a journal are printed in 5 lines of special characters and the receipt is issued.

The character side is 12 × 24, and the number of characters is 30 characters for each of receipt and journal.



(3) Check content

1) Check that the diagonal lines of special characters are clear.
2) Check that the receipt and the journal are printed in a uniform density.
3) Check the operations of paper feed and logo print.
4) Check partial cut and full cut.

(4) Cancel

After completion of the above print, the test is terminated.

4-3. Printer CG test

(1) Operation

* Stand-alone test: SW1-3 → ON-LINE
* Connection test: Selection of test item → ENTER key ON

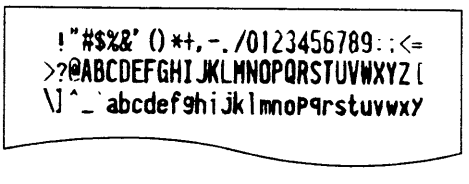
(2) Content

All CG in the flash ROM or CG ROM are printed.

(3) Check

Check the print as follows:

Print example



(4) Cancel

After completion of the above print, the test is terminated.

4-4. Drawer open & sense test

(1) Operation

* Stand-alone test: SW1-4 or -5 → ON-LINE key ON

Note: SW1-4 = Drawer 1 or SW1-5 = Drawer 2

* Connection test: Selection of test item → ENTER key ON

Note: Test item = Drawer 1 open sense test or Drawer 2 open sense test

(2) Content

The drawer is opened and the drawer open sensor state is expressed with the print/display (connection test only).

① Drawer open sensor test (Close test) Result 0

② Drawer open

Visually check that the drawer is opened.

③ Drawer open sensor test (Open test) Result 1

④ Drawer close

⑤ Drawer open sensor test (Close test) Result 0

(3) Check content

* Visually check that the drawer is opened.

* Check the sensor with the print/display (connection test only).

① Print (Stand-alone/Connection test)

	Drawer 1	Drawer 2
Test result is 1→ 0→ 1:	TEST004:OK	TEST005:OK
Test result is other than the above:	TEST004:ERR	TEST005:ERR

② Display (connection test only)

Example: DRAWER1 =OPEN

Item	State	Content
DRAWER1	OPEN/CLOSE	The state of drawer 1 open sensor is displayed.
DRAWER2	OPEN/CLOSE	The state of drawer 2 open sensor is displayed.

(4) Cancel

Stand-alone test → The print is made and the test is terminated.

Connection test → Same as above.

4-5. RS232 loop test

(1) Operation

* Stand-alone test: SW1-6 → ON-LINE key ON

(2) Content

The loop back test is performed with a service jig (UKOG-6705RCZZ).

1) Control signal test

The test is made with ON/OFF of ER=DR signal.

2) Data transfer test

The loop back data transfer test of 00H ~ FFH (256Byte) is performed.

Note: Test is made with the baud rate of 38,400 BPS (the highest speed).

(3) Check content

Check the print below:

TEST006: OK	TEST006: EX
(Normal print)	(Error print)

X= 1: ER-DR connection error

2: Not used.

3: TXD-RXD verify error

4: Time out error

(4) Cancel

The above print is made and the test is terminated.

4-6. Flash ROM & CG ROM sum test

(1) Operation

* Stand-alone test: SW1-7 → ON-LINE key ON

* Connection test: Selection of test item → ENTER key ON

(2) Content

1) All data sum test of the flash ROM is performed.

2) All data sum test of the CG ROM is performed.

* Display: ROM TEST (Connection test only)

(3) Check content

Check with the following prints.

TEST007: F-ROM OK 28F40***** CGROM ---	TEST007: F-ROM ERR 28F40***** CGROM ---	NOTE **** : ROM version
(Normal print)	(Error print)	

CGROM ---
(CG ROM not installed)

(4) Cancel

The above print is made and the test is terminated.

4-7. RAM test

(1) Operation

* Stand-alone test: SW1-8 → ON-LINE key ON

* Connection test: Selection of test item → ENTER key ON

(2) Content

Tests of RAM 256Kbit × 2 pcs. are made. Memory data must not be changed immediately before and after the test job.

① Perform the following process for the memory byte address (H'400000 ~ H'40FFFF).

PASS1: Memory save

PASS2: Data 0000H write

PASS3: Data 0000H read & compile, data 5555H write

PASS4: Data 5555H read & compile, data AAAAH write

PASS5: Data AAAAH read & compile

PASS6: Memory data load

② In case of COMPILE ERR in PASS1 ~ 6 tests, the error print is made. If there is no error up to the last address, the test is terminated normally.

③ In addition, the following tests are performed. (For the specifications of address test, refer to the flowchart on the next page.)

TEST POINT ADDRESS= H'400000,H'400002,H'400004,
H'400008,H'400010,H'400020,
H'400040,H'400080,H'400100,
H'400200,H'400400,H'400800,
H'401000,H'402000,H'404000

* Display: RAM TEST (Connection test only)

(3) Check content

Check with the following prints:

TEST008: RAM1 OK RAM2 OK (Normal print)	TEST008: RAM1 OK RAM2 ERR (Error print)

Note:

RAM1=Odd address (Control PWB IC17)

RAM2=Even address (Control PWB IC18)

(4) Cancel

The above print is made and the test is terminated.

4-8. Auto test

(1) Operation

* Stand-alone test: SW1/SW2 all ON → ON-LINE key ON
* Connection test: Selection of test item → ENTER key ON

(2) Content

* Display: Auto test (Connection test only)

In the connection test, the test result is not displayed.

(2-1) Head up lever test

(1-①) Open the head up lever.

While it is opened, the intermittent buzzer sounds. (Intermittent buzzer = 0.5sec ON/0.5sec OFF)

(1-②) Close the head up lever.

The intermittent buzzer stops.

(2-2) Key/Lamp/Buzzer test

(2-①) Every time when JF → RF → ON-LINE key is pressed in this sequence, the buzzer sounds. (Short buzzer/0.5sec)

(2-②) The ON-LINE lamp and the ERR lamp light up in this sequence for 0.5sec and go off.

(2-③) The buzzer sounds once, and the ON-LINE lamp lights up. (During the test, the ON-LINE lamp keeps ON.)

(2-3) R/J printer test (Refer to the R/J printer test.)

(2-4) Paper near end test

Note: In PWB individual test, near end state is forcibly made for testing.)

Print → TEST092:NEX (X=0/1 Not near end/ Near end)

(2-5) Drawer open test (For the print content, refer to the drawer open test.)

* Only stand-alone test is available. (No connection test)

① Drawer open sensor test (Close test)

② Drawer open
Visually check that the drawer is opened.

③ Drawer open sensor test (Open test)

④ Drawer close

⑤ Drawer open sensor test (Close test)

(2-6) RS232 loop test (Only stand-alone test available. Refer to RS232 loop test.)

(2-7) Flash ROM write & sum/CG ROM sum test (Refer to Flash ROM write & sum/CG ROM sum test.)

(2-8) RAM test (Refer to RAM test.)

(2-9) DIP SW & J1/J2 state test (Refer to DIP SW & J1/J2 state test.)

(3) Check

Check the print and visually check.

(4) Cancel

After completion of the test, the end print is made and the test is terminated.

TEST009:END (End print)

4-9. Aging test

(1) Operation

* Stand-alone test: SW1 all ON, SW2 all OFF → ON-LINE key ON
* Connection test: Selection of test item → ENTER key ON

(2) Content

* Display: AGING TEST (Connection test only)

Continuous operations are repeated: R/J print → 1sec pause → Drawer 1 open → 1sec pause → Drawer 2 open → 9sec pause → R/J print

* R/J printer print sample *

```
0123456789ABCDE
 0123456789ABCDE
  0123456789ABCDE
   0123456789ABCDE
    0123456789ABCDE
     0123456789ABCDE
```

← AUTO CUT (RECEIPT)

NOTE
① R/J print content is common.
② The receipt must be cut automatically.
③ Drawer open sense is not required.

(3) Check content

Check the print content and visually check that the drawer is opened.

(4) Cancel

Turn off the power to terminate the test.

4-10. Paper end/Near end/Head up test

(1) Operation

* Connection test: Selection of test item → ENTER key ON

(2) Content

Printer paper end, near end sensor and head up lever state are displayed.

(3) Check content

Check the printer paper end, near end sensor, and the head up lever state with the display.

Display

Example: R-PAPER =END

Item	Display content
R-PAPER	PAPER END SENSOR RECEIPT=END/NOTEND
J-PAPER	PAPER END SENSOR JOURNAL=END/NOTEND
NEAR END	RECEIPTorJOURNAL NEAR END SENSOR=END/NOTEND
HEAD UP	THERMAL PRINTER HEAD UP LEVER=OPEN/CLOSE

(4) Cancel

Connection test → Press any key to print the end print and terminate the test.

TEST011:END (End print)

4-11. A/D conversion test

(1) Operation

* Connection test: Selection of test item → ENTER key ON

(2) Content

The digital conversion values of signals inputted to the A/D convertor in the CPU are displayed sequentially.

By timer control, the display channel is revised every 1 sec and display is repeated.

		Display
* Thermistor input (AN0)	→	TM1 = ****
* +24V input (AN1)	→	VPTEST= ****
* VPRF input (AN4)	→	VPRF = ****

Note: "****": A/D converted 10bit data are displayed in decimal number. Therefore, the display content ranges 0000 ~ 1024.

(3) Check

Check the display content.

(4) Cancel

Press any key to print the end print and terminate the test.

TEST012:END (End print)

4-12. DIP SW & J1/J2 test

(1) Operation

* Connection test: Selection of test item → ENTER key ON (The stand-alone test is included in the auto test.)

(2) Content

DIP SW and J1/J2 (thermal head resistor LANK) is printed.

(3) Check

The following print is made.

TEST013:	DSW1	********
	DSW2	********
	J2/J1	**

(4) Cancel

The above print is made and the test is terminated.

CHAPTER 11. IPL (Initial Program Loading) MODE

There are two methods to write software into the flash memory on the control PWB by using the IPL mode.

- Writing by the master ROM
- Writing by PC

1. Writing IPL software by the master ROM

The contents of the master ROM are loaded into the flash ROM. In this method, all the programs including the application programs and the IPL software are loaded into the flash memory.

* The part code of the master ROM used here is UHI27040RAY1A. Refer to "CHAPTER 2. OPTIONS."

1-1. Use

In the following cases, use the method of writing by the master ROM.

- When the flash memory is replaced because of the flash memory breakdown.
- When the internal data of the flash ROM are broken by noises such as static electricity.
- When the program must be revised due to version up of the IPL program.

1-2. Program loading to flash ROM

(1) Install the master ROM (written P-ROM) to the IC socket of the control PWB.

(2) Turn on SW1 2-3 on the control PWB. (Refer to Fig. 1 on the next page.)

(3) Turn on the power switch.

(4) Delete all area of flash ROM ① ~ ⑥ with the program of the master ROM ① block-1 (IPL section).

(5) Load the program in the master ROM ① ~ ⑥ to the flash ROM ① ~ ⑥.

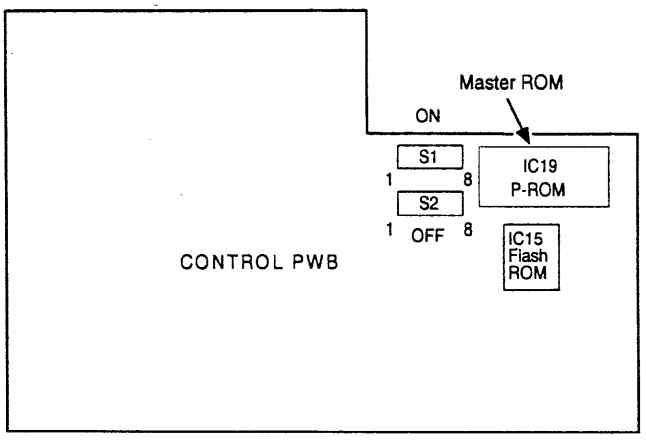
(6) Verify the program in the master ROM ① ~ ⑥ and the flash ROM ① ~ ⑥.

(7) If O.K., the buzzer sounds once and the test is terminated.
If N.G., the buzzer sounds continuously.

(8) Turn off the power switch.

(9) Remove the master ROM from the IC socket of the control PWB.

Master ROM	→	Flash ROM	Capacity
① BLOCK-0		① BLOCK-0	128 Kbit × 1 BLOCK
② BLOCK-1		② BLOCK-1	128 Kbit × 1 BLOCK
③ BLOCK-2/3/4/5/6/7/8/9/10/11/12/13/14/15		③ BLOCK-2/3/4/5/6/7/8/9/10/11/12/13/14/15	128 Kbit × 14 BLOCK
④ BLOCK-16/17/18/19/20/21/22/23/24/25/26/27/28/29		④ BLOCK-16/17/18/19/20/21/22/23/24/25/26/27/28/29	128 Kbit × 14 BLOCK
⑤ BLOCK-30		⑤ BLOCK-30	128 Kbit × 1 BLOCK
⑥ BLOCK-31		⑥ BLOCK-31	128 Kbit × 1 BLOCK



2. Writing the application software by PC

The IPL software (IPL.EXE) and the ER-01PU application program (ER01PU.S) are set on the PC and the IPL software (IPL.EXE) is started. Then the application programs are loaded to the flash memory of the ER-01PU connected with RS232.

* The part code of FD used here is UKOG-6723RCZZ. Refer to "CHAPTER 2. OPTIONS."

2-1. Use

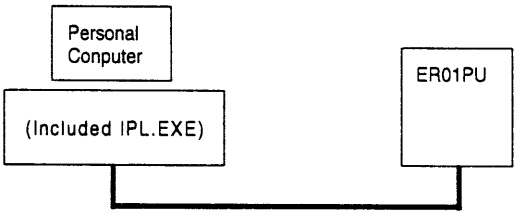
This method is used only when the application programs only are loaded into the flash ROM.

In this method, the IPL software is not written into the flash ROM. To write the IPL software or in the case of version up, use the method by the master ROM.

- Downloading the Application Programming on ER01PU bye IPL PROGRAMMING.

General) ER01PU's APPLICATION PROGRAMMING is placed on Flash ROM. And, ER01PU's APPLICATION PROGRAMMING can be changed by IPL PROGRAM via RS232.

System configuration)



Procedure)

No	Contents	Printer Status
1	Install "IPL.EXE" on your Personal Computer.	
2	IPL mode is selected on ER01PU.	Set to "ON" on Bit1 of Dip Switch 2 to IPL Mode.
3	Turn ON the power while pressing the R/J key.	ERROR Lamp and On-line Lamp is blinking.
4	IPL mode is entered when the R key is set to ON. (The printer clears the application program area of the flash ROM.)	ERROR Lamp is blinking and On-line Lamp is turn off.
5	Wait the application program data.	ERROR Lamp is turn off and On-line Lamp is turn on.
6	Execute "IPL.EXE" on Personal Computer. (Example Operation: "IPL ER01PU.S")	On-line Lamp is blinking.
7	Finish "IPL.EXE" on Personal Computer.	On-line Lamp stop to blink.
8	Turn OFF the power.	
9	Normal mode is sellected on ER01PU.	Set to "OFF" on Bit1 of Dip Switch 2 to Normal Mode.
10	Execute "Master Reset" on ER01PU.	

The specification of "IPL.EXE" is as follows.

usage: IPL [FILE] [–b<baudrate>] [–p<parity>]

[FILE] ...S-Type Object Format File Name

[–b<baudrate>]...2400, 4800, 9600, 19200, 38400 [default –b38400]

[–p<parity>] ...N: None

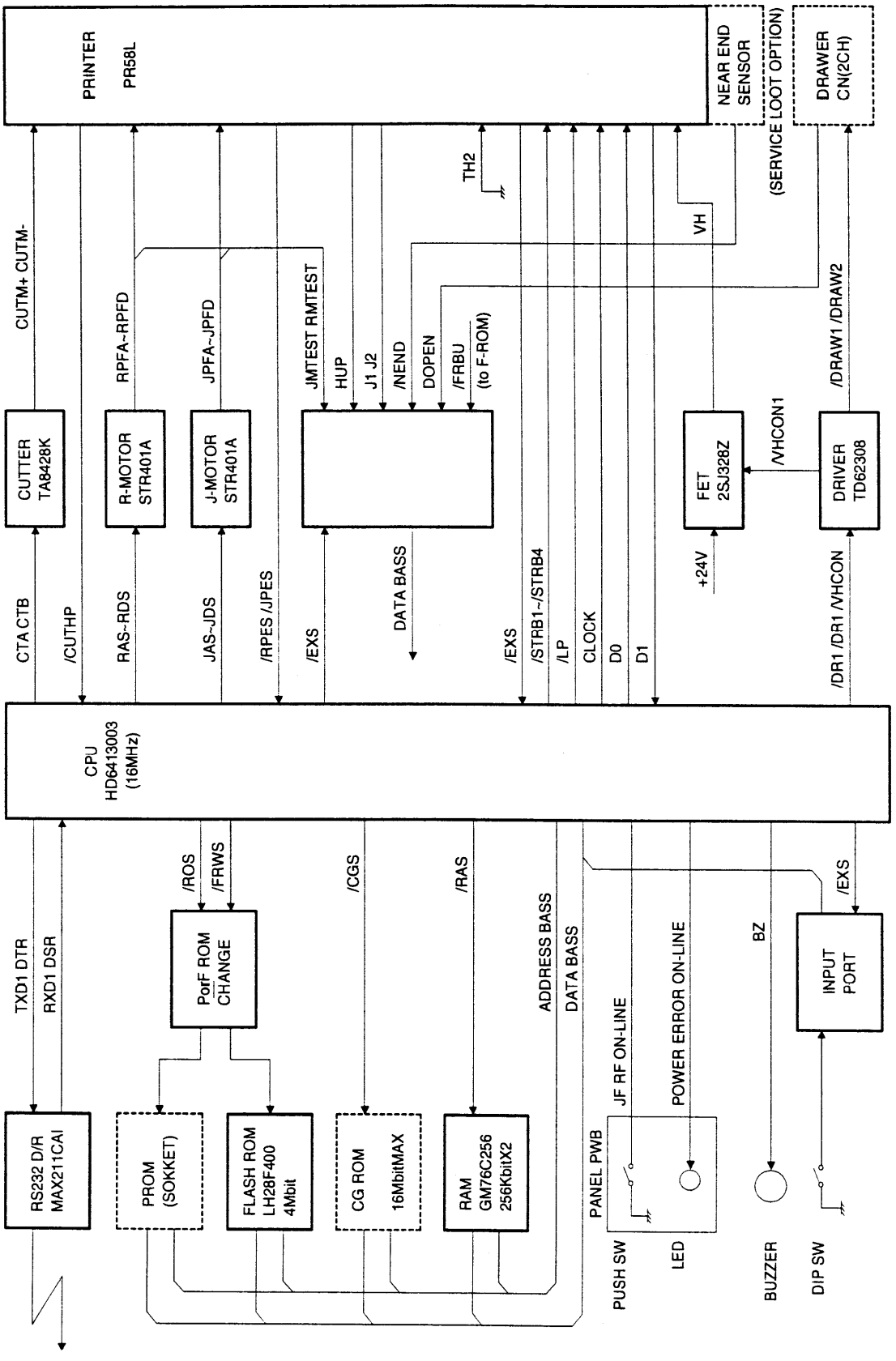
O: Odd

E: Even [default –pN]

Note: IPL Program can not be change the Boot Program (IPL Program/RS232 Program) on ER01PU.
When you want to change above Program, you must copy these programs from P-ROM to Flash ROM.

CHAPTER 12. HARDWARE DESCRIPTION

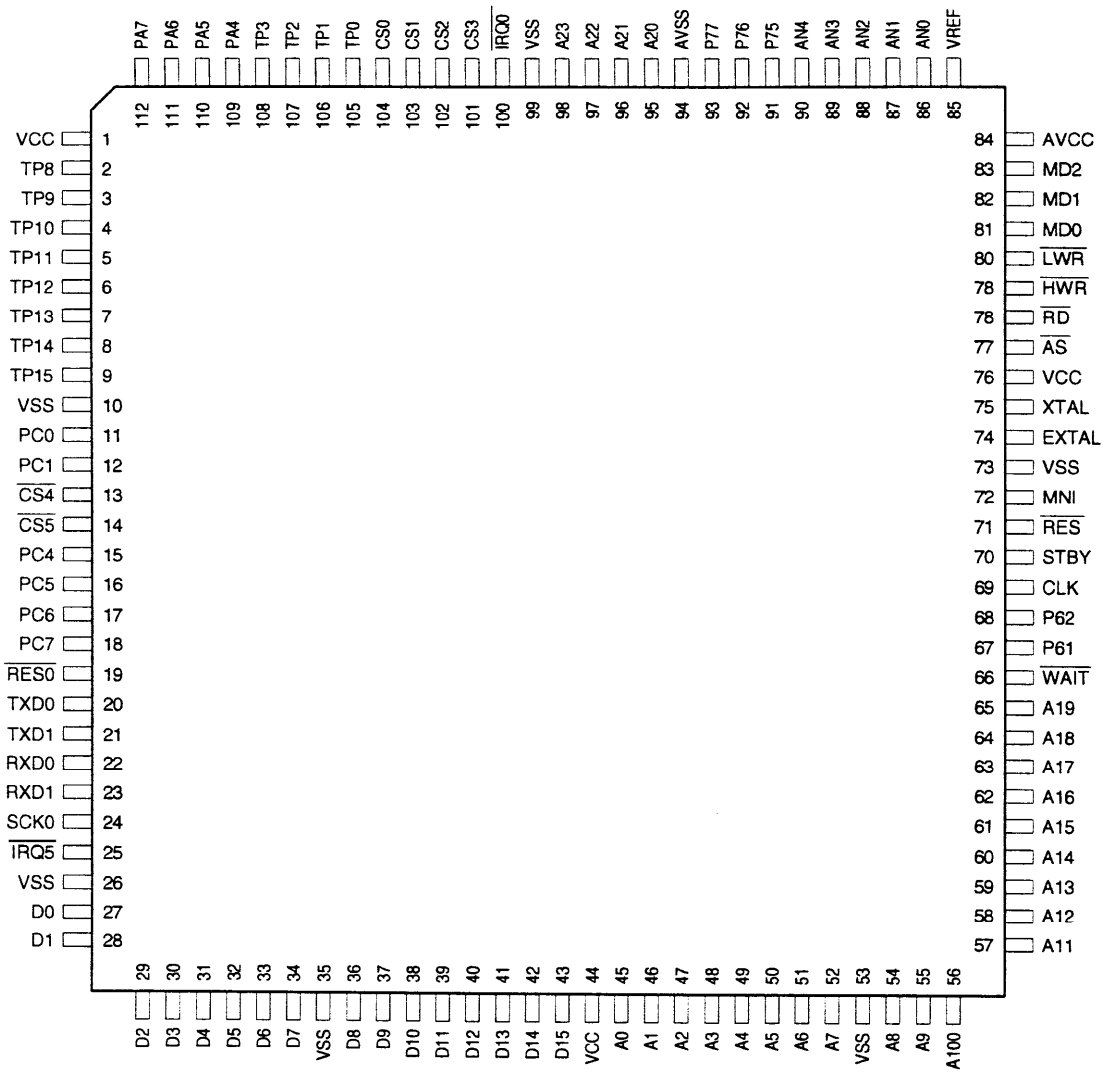
1. Block diagram



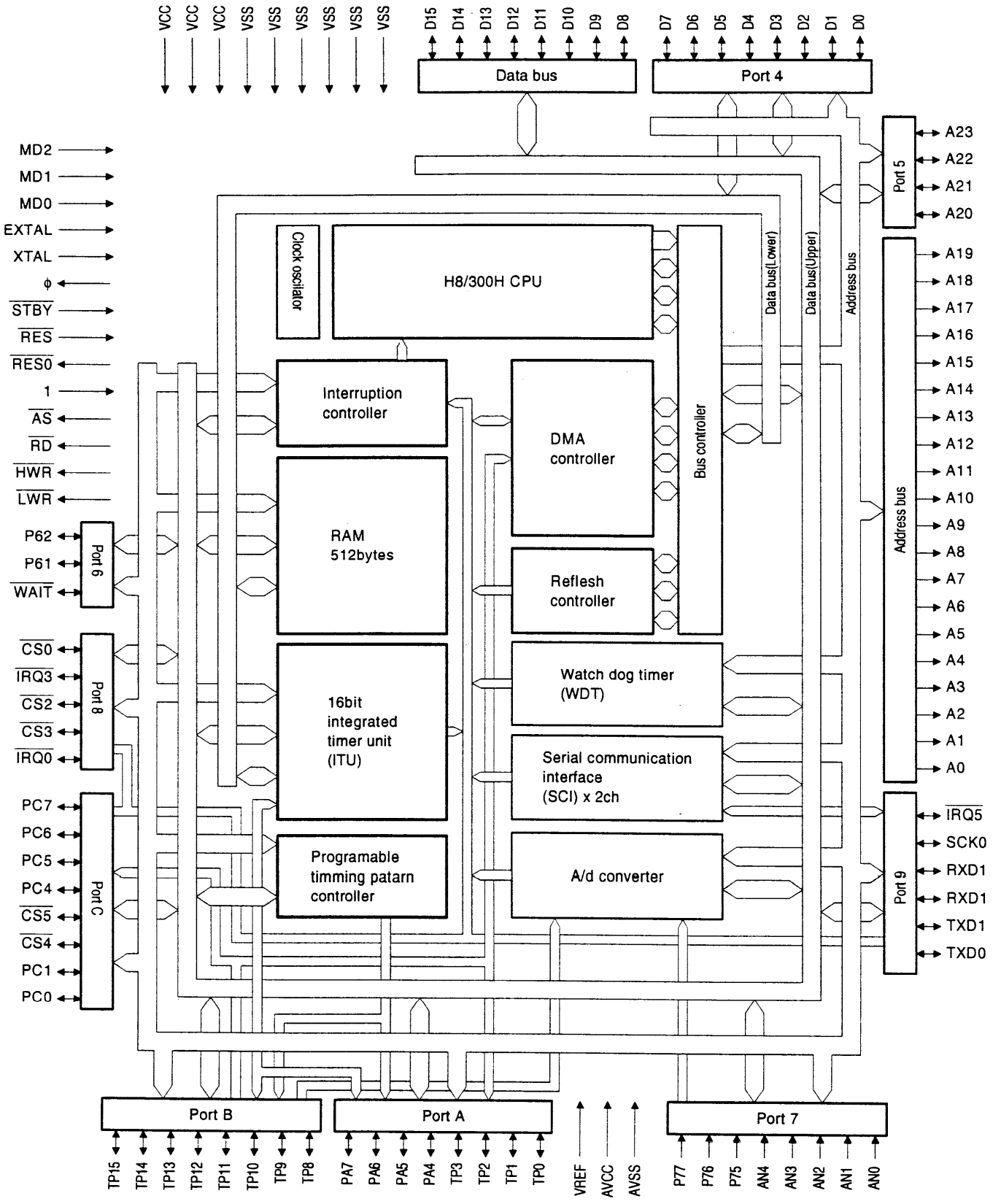
2. Description of main LSI's

2-1. CPU (HD6413003)

1) Pin configuration



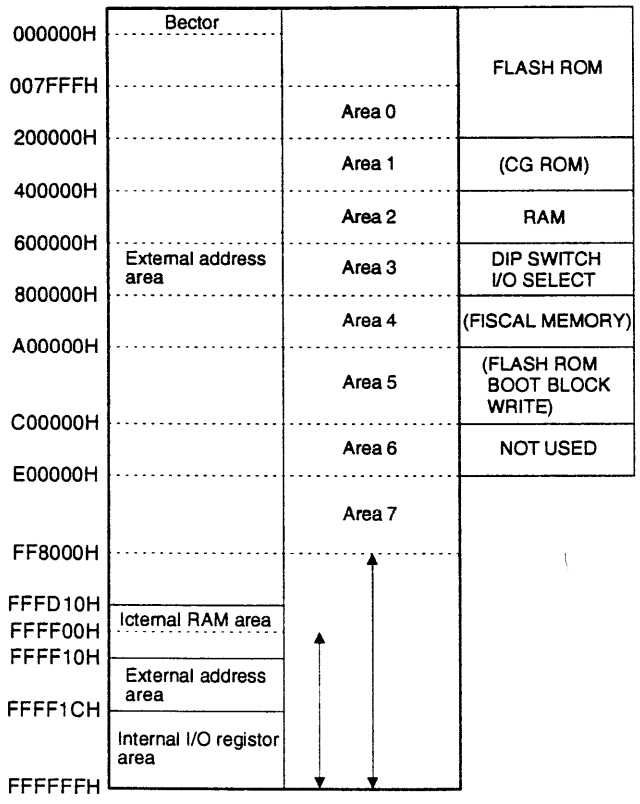
2) Block diagram



3) Pin description

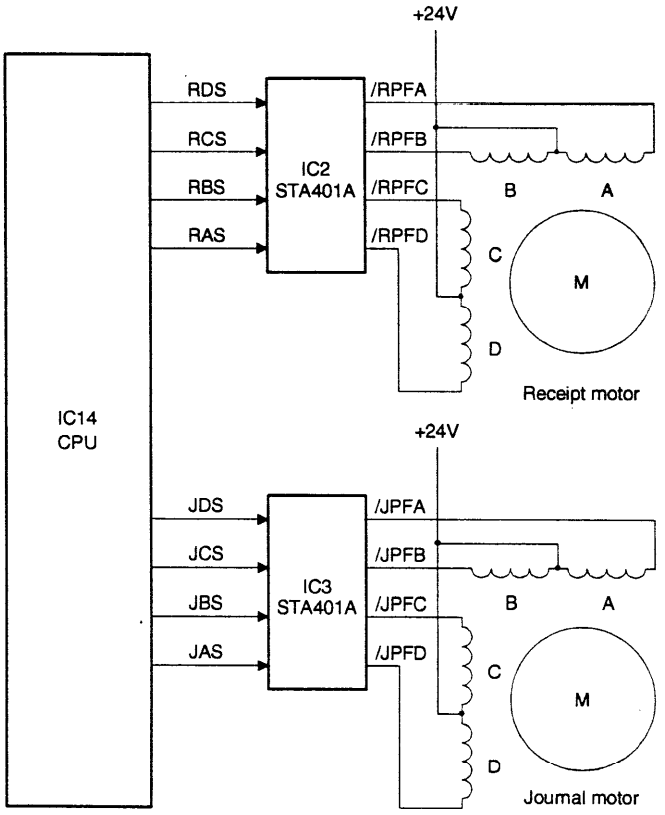
Pin No.	Pin name	Signal name	In/Out	Function
1	VCC	VCC	In	+5V
2	TP8	JAS	Out	Janal side paper feed pulse motor drive signal: Phase A
3	TP9	JBS	Out	Janal side paper feed pulse motor drive signal: Phase B
4	TP10	JCS	Out	Janal side paper feed pulse motor drive signal: Phase C
5	TP11	JDS	Out	Janal side paper feed pulse motor drive signal: Phase D
6	TP12	RAS	Out	Receipt side paper feed pulse motor drive signal: Phase A
7	TP13	RBS	Out	Receipt side paper feed pulse motor drive signal: Phase B
8	TP14	RCS	Out	Receipt side paper feed pulse motor drive signal: Phase C
9	TP15	RDS	Out	Receipt side paper feed pulse motor drive signal: Phase D
10	VSS	GND	—	GND
11	PC0	/DR1	Out	Drawer open signal
12	PC1	/DR2	Out	Drawer open signal
13	/CS4	/FMS	Out	Fiscal memory select signal
14	/CS5	/FRWS	Out	Flash ROM write select signal
15	PC4	/DSR	Out	Data set ready signal
16	PC5	/CTS	Out	Clear to send signal
17	PC6	/DTR	Out	Data terminal ready
18	PC7	/VHCON	Out	Head drive common power (+24V) control signal
19	/RES0	/RES0	Out	Reset signal
20	TXD0	SHEAD	Out	Send data to thermal head
21	TXD1	TXD1	Out	Send data to RS232 interface
22	RXD0	RHEAD	In	Read data from thermal head
23	RXD1	RXD1	In	Read data from RS232 interface
24	SCK0	CLOCK	Out	Thermal head clock signal
25	/IRQ5	/CUTHP	In	Auto cutter home position detect signal
26	VSS	GND	—	GND
27	D0	D0	In/Out	Data bus: D0
28	D1	D1	In/Out	Data bus: D1
29	D2	D2	In/Out	Data bus: D2
30	D3	D3	In/Out	Data bus: D3
31	D4	D4	In/Out	Data bus: D4
32	D5	D5	In/Out	Data bus: D5
33	D6	D6	In/Out	Data bus: D6
34	D7	D7	In/Out	Data bus: D7
35	VSS	GND	—	GND
36	D8	D8	In/Out	Data bus: D8
37	D9	D9	In/Out	Data bus: D9
38	D10	D10	In/Out	Data bus: D10
39	D11	D11	In/Out	Data bus: D11
40	D12	D12	In/Out	Data bus: D12
41	D13	D13	In/Out	Data bus: D13
42	D14	D14	In/Out	Data bus: D14
43	D15	D15	In/Out	Data bus: D15
44	VCC	VCC	In	+5V
45	A0	A0	Out	Address bus: A0
46	A1	A1	Out	Address bus: A1
47	A2	A2	Out	Address bus: A2
48	A3	A3	Out	Address bus: A3
49	A4	A4	Out	Address bus: A4
50	A5	A5	Out	Address bus: A5
51	A6	A6	Out	Address bus: A6
52	A7	A7	Out	Address bus: A7
53	VSS	GND	—	GND
54	A8	A8	Out	Address bus: A8
55	A9	A9	Out	Address bus: A9
56	A10	A10	Out	Address bus: A10
57	A11	A11	Out	Address bus: A11
58	A12	A12	Out	Address bus: A12
59	A13	A13	Out	Address bus: A13
60	A14	A14	Out	Address bus: A14
61	A15	A15	Out	Address bus: A15
62	A16	A16	Out	Address bus: A16
63	A17	A17	Out	Address bus: A17
64	A18	A18	Out	Address bus: A18
65	A19	A19	Out	Address bus: A19
66	/WAIT	+5V	In	+5V
67	P61	CTA	Out	Cutter motor control signal
68	P62	CTB	Out	Cutter motor control signal
69	CLK	16M	Out	System clock
70	STBY	+5V	In	+5V
71	/RES	/RESET	In	Reset signal
72	NMI	GND	—	GND
73	VSS	GND	—	GND
74	EXTAL	EXTAL	In	Clock oscillator: 16 MHz
75	XTAL	XTAL	In	Clock oscillator: 16 MHz
76	VCC	VCC	In	+5V
77	/AS	NC	—	NC
78	/RD	/RD	Out	Read signal
79	/HWR	/HWR	Out	Upper write signal
80	/LWR	/LWR	Out	Lower write signal
81	MD0	M1	In	Mode select: +5V (MODE3)
82	MD1	M1	In	Mode select: +5V (MODE3)
83	MD2	M2	In	Mode select: GND (MODE3)
84	AVCC	+5V	In	+5V
85	VREF	+5V	In	+5V
86	AN0	/HEADTM	In	Detection of voltage across thermalhead thermistor
87	AN1	+24V	In	+24V test input
88	AN2	/RPES	In	Receipt paper end sensor
89	AN3	/JPES	In	Journal paper end sensor
90	AN4	VPREF	In	Reference voltage to detect fluctuation in thermalhead voltage VH (+24V)
91	P75	/JFSW	In	Journal paper feed switch
92	P76	/RFSW	In	Receipt paper feed switch
93	P77	/ONLSW	In	On-line switch
94	AVSS	GND	—	GND
95	A20	A20	Out	Address bus: A20
96	A21	NC	—	NC
97	A22	NC	—	NC
98	A23	NC	—	NC
99	VSS	GND	—	GND
100	/IRQ0	/POFF	In	Power off signal
101	CS3	/EXS	Out	Dip switch/IO-read chip select signal
102	CS2	/RAS	Out	RAM chip select signal
103	CS1	/CGS	Out	CG ROM chip select signal
104	CS0	/ROS	Out	Flash ROM chip select signal
105	TP0	/STRB1	Out	Thermal head drive strobe signal 1
106	TP1	/STRB2	Out	Thermal head drive strobe signal 2
107	TP2	/STRB3	Out	Thermal head drive strobe signal 3
108	TP3	/STRB4	Out	Thermal head drive strobe signal 4
109	PA4	/LP	Out	Thermal head drive latch signal
110	PA5	BZ	Out	Buzzer signal
111	PA6	DONLN	Out	On-line lamp signal
112	PA7	DERR	Out	Data error lamp signal

3. Memory map



4. Printer control

1) Paper feed control



The paper feed motors are stepping motors with 4-phase driving coils.

The motors are driven by switching over the driving coils.

<MOTOR DRIVE SEQUENCE>

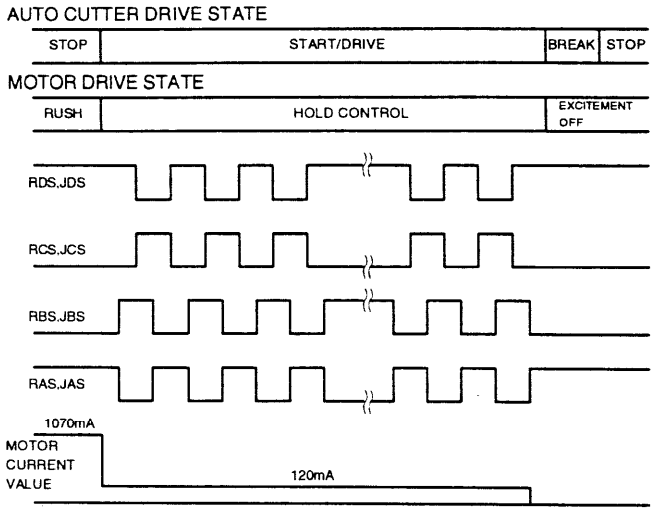
JOURNAL MOTOR

	/JPFA	/JPFB	/JPFC	/JPFD
STEP No.	PHASE A	PHASE B	PHASE C	PHASE D
1	ON	OFF	OFF	ON
2	ON	OFF	ON	OFF
3	OFF	ON	ON	OFF
4	OFF	ON	OFF	ON

RECEIPT MOTOR

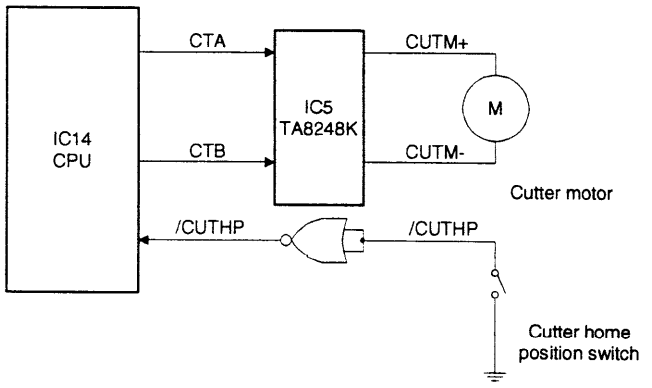
	/RPFA	/RPFB	/RPFC	/RPFD
STEP No.	PHASE A	PHASE B	PHASE C	PHASE D
1	ON	OFF	OFF	ON
2	ON	OFF	ON	OFF
3	OFF	ON	ON	OFF
4	OFF	ON	OFF	ON

<MOTOR DRIVE SIGNAL HOLD CONTROL>



Motor drive signal hold control is made to provide paper holding power during the operation of the auto cutter.

2) Auto cutter control



To drive the auto cutter, a DC24V motor is used. Selection of full cut and partial cut is made by changing the rotating direction of the motor. This selection is made on the ECR side.

<MOTOR DRIVE SEQUENCE>

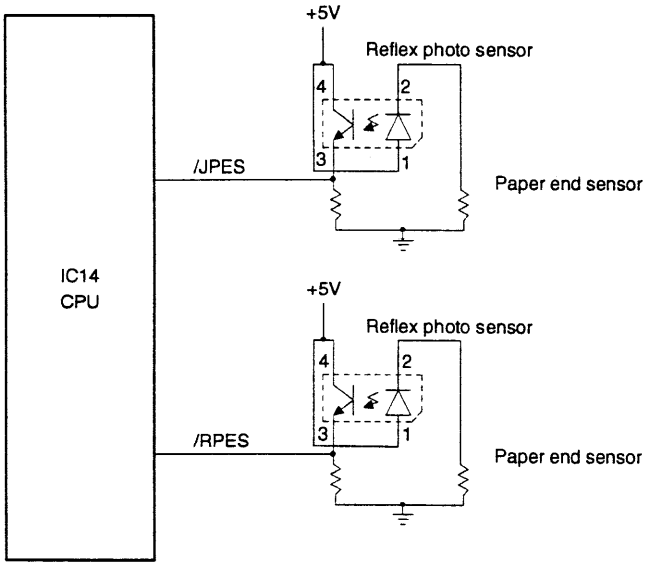
MOTOR +/– PIN CONTROL		MOTOR ROATING DIRECTION	CUT METHOD
CUTM+	CUTM–		
H	L	CCW	FULL CUT
L	H	CW	PARTIAL CUT

H: Connected to DC24V.I CCW: Counter clock wise

L: Connected to GND. CW: Clock wise

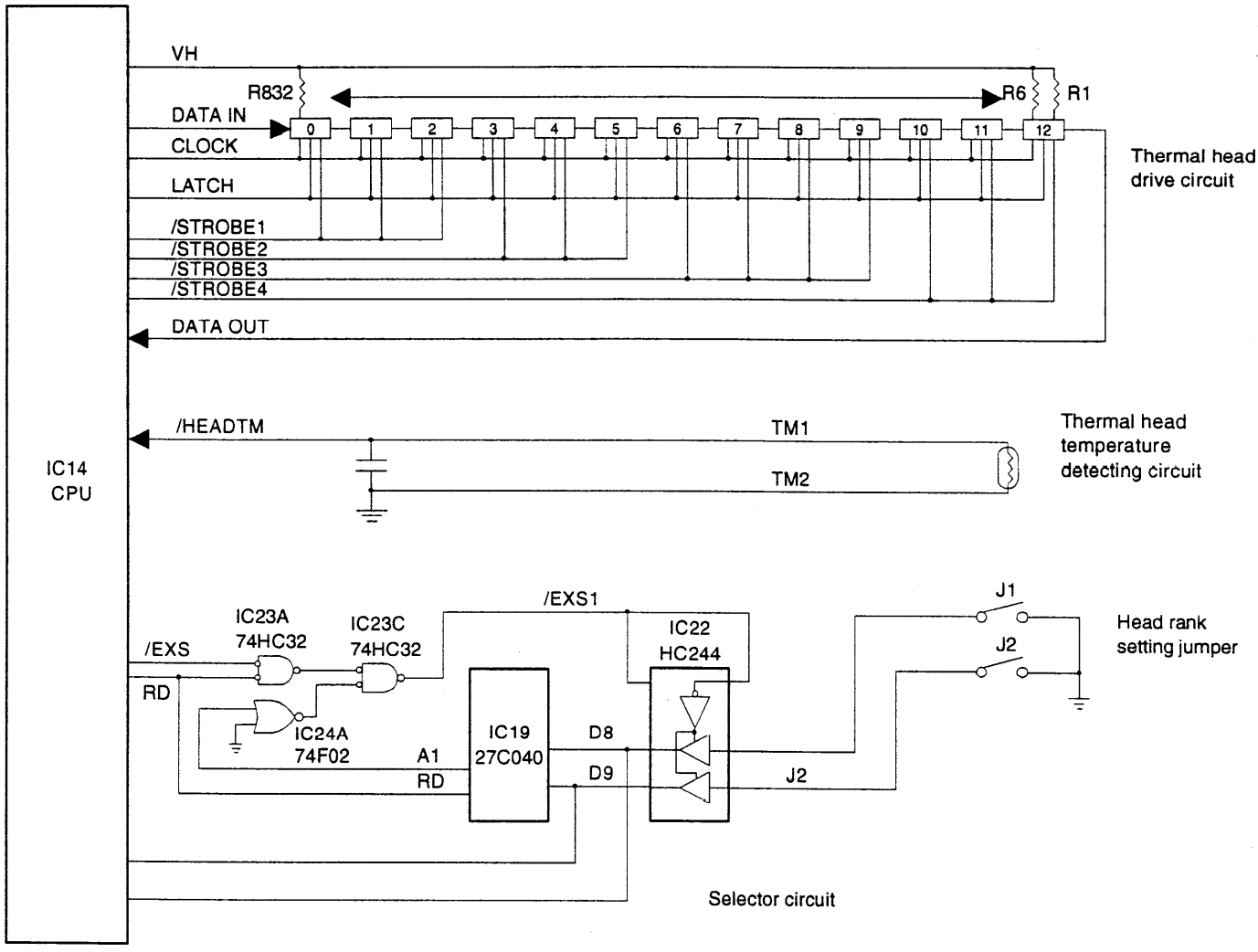
To detect the auto cutter home position, a microswitch is used.

3) Paper end sensor circuit



The reflex photo sensor on the printer PWB detects the presence/absence of the paper passing under the journal and receipt platens.

4) Thermal head control



① Thermal head drive circuit

Print data which has been entered through DATA IN in synchronization with the CLOCK signal is stored in LATCH according to the timing (832 dots) of the LATCH signal. Stored print data is output by the /STROBE1, /STROBE2, /STROBE3, and /STROBE4 signals to energize the heating element, thus performing printing. Print data (832 dots) is divided by four STROBE signals into the following four parts before being output.

	RECEIPT			JOURNAL		
	ABC.....			ABC.....		
	↑		↑	↑		↑
Dot No.:	1	~	384	449	~	832

STROBE No.	DOT No.	Dots/ Strobe	NOTE
/STROBE4	1 ~ 192	192	
/STROBE3	193 ~ 448	256	
/STROBE2	449 ~ 640	192	Excluding dots 385 to 448 (Nonprintable area)
/STROBE1	641 ~ 832	192	

② Thermalhead temperature detecting circuit

By detecting the resistance of the thermalhead thermistor, the head temperature is calculated to control the conduction pulse width of the head.

③ Head rank setting jumper

Since the thermalhead resistance fluctuates, they are classified into the following four ranks.

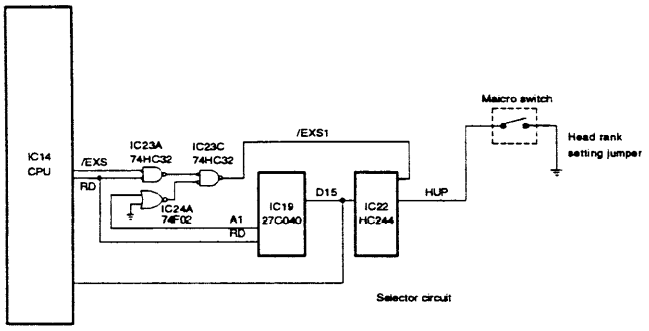
For classification into ranks, identify with J1 and J2 soldering on the pattern of the head unit.

RANK	HEAD RESISTANCE [Ω]	J1, J2
A	1171 ~ 1255	Solder J2 alone
B	1091 ~ 1170	No soldering
C	1011 ~ 1090	Solder J1 alone
D	927 ~ 1010	Solder both J1 and J2

④ Solenoid circuit

The state of J1 and J2 is recognized by the selector circuit.

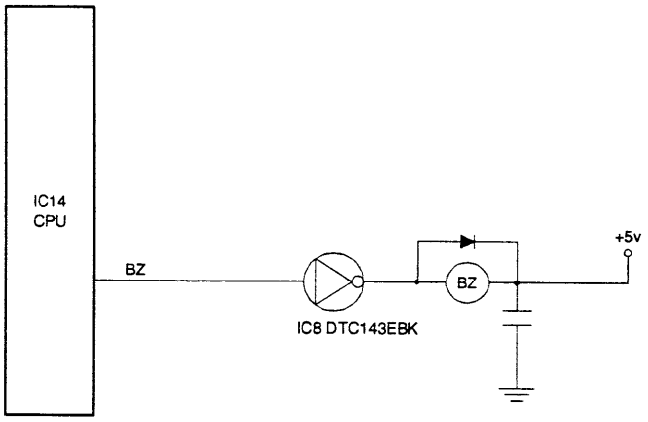
5) Head up sensor circuit



The state is detected by the microswitch provided to the left side of the printer.

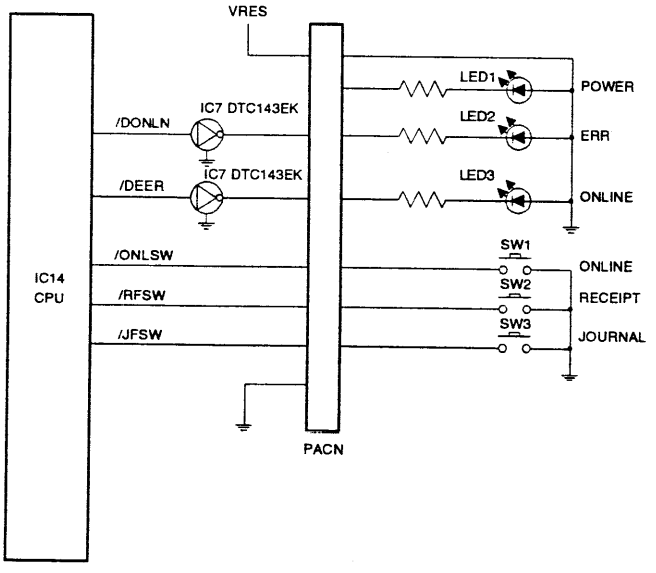
The state of HUP signal is recognized by the selector circuit.

5. Buzzer control



By the BZ signal from the CPU, +5V flows through the buzzer to sound it.

6. Switches and LED lamp control



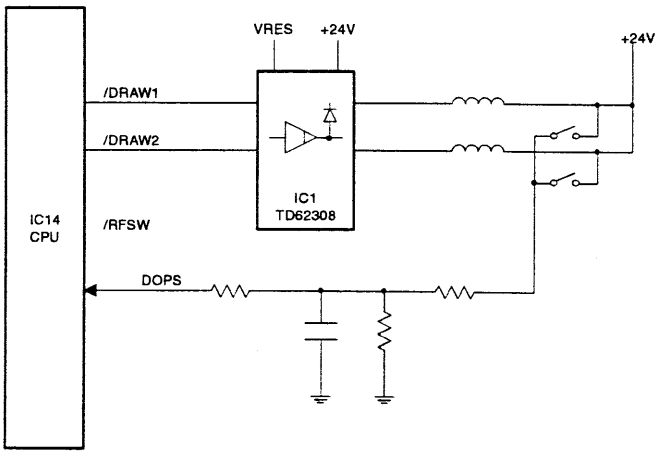
There are following three kinds of LED's. The states are shown in the table.

LED No.	NAME	FUNCTION
LED1	POWER	Lights up when the power is turned ON.
LED3	ONLINE	Light up when in ON-LINE. Goes off when in OFF-LINE.
LED2	ERR	Lights up when an error occurs. Goes off when an error is canceled.

There are following three kinds of switches. The states are shown in the table.

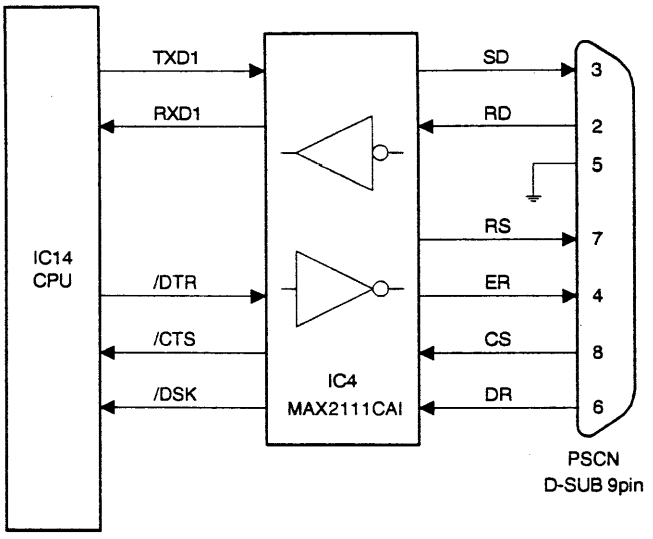
SWITCH No.	NAME	FUNCTION
SW1	ONLINE	Switches between ON-LINE and OFF-LINE.
SW2	RECEIPT	Feeds the receipt paper. Effective in OFF-LINE.
SW3	JOURNAL	Feeds the journal paper. Effective in OFF-LINE.

7. Drawer drive control



The driver circuit is provided to allow connection of up to two drawers. For connection of drawers, a connector must be provided on the PWB.

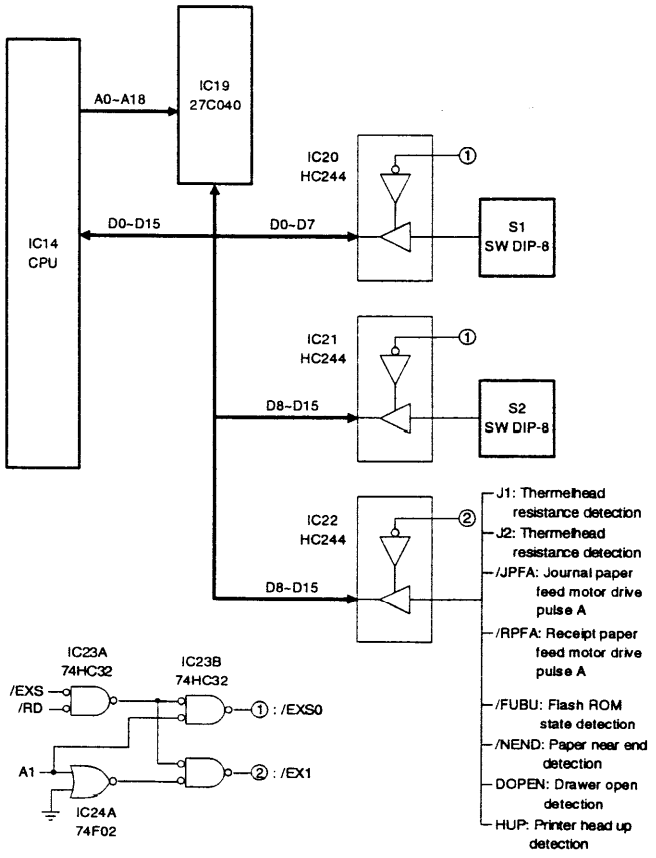
8. RS-232 control



One channel of the RS-232 connector is provided as a standard part for communication with the host.

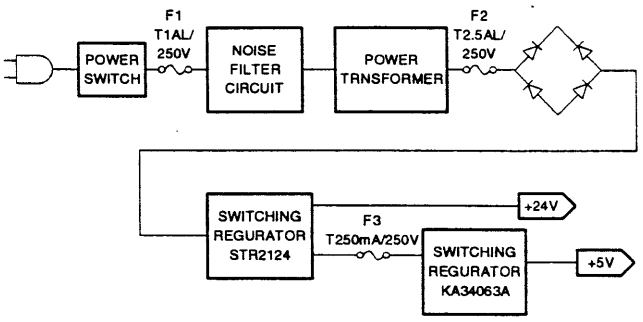
The CPU delivers the control signal through the driver/receiver IC to the host, performing communication.

9. Selector circuit



The DIP switches are provided for switching various functions and the selector IC (HC244) are provided for detecting various hardware states.

10. Power supply circuit

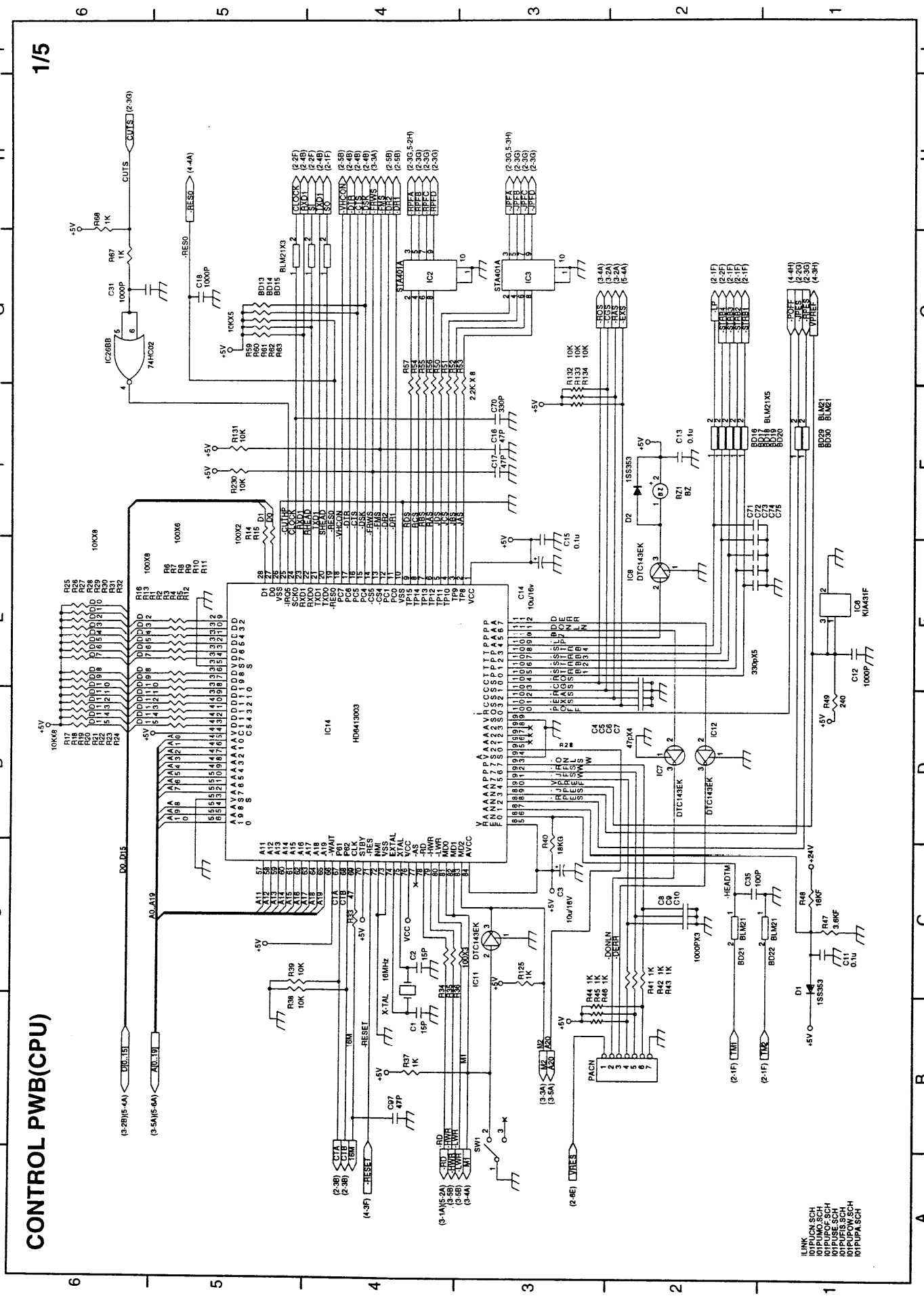


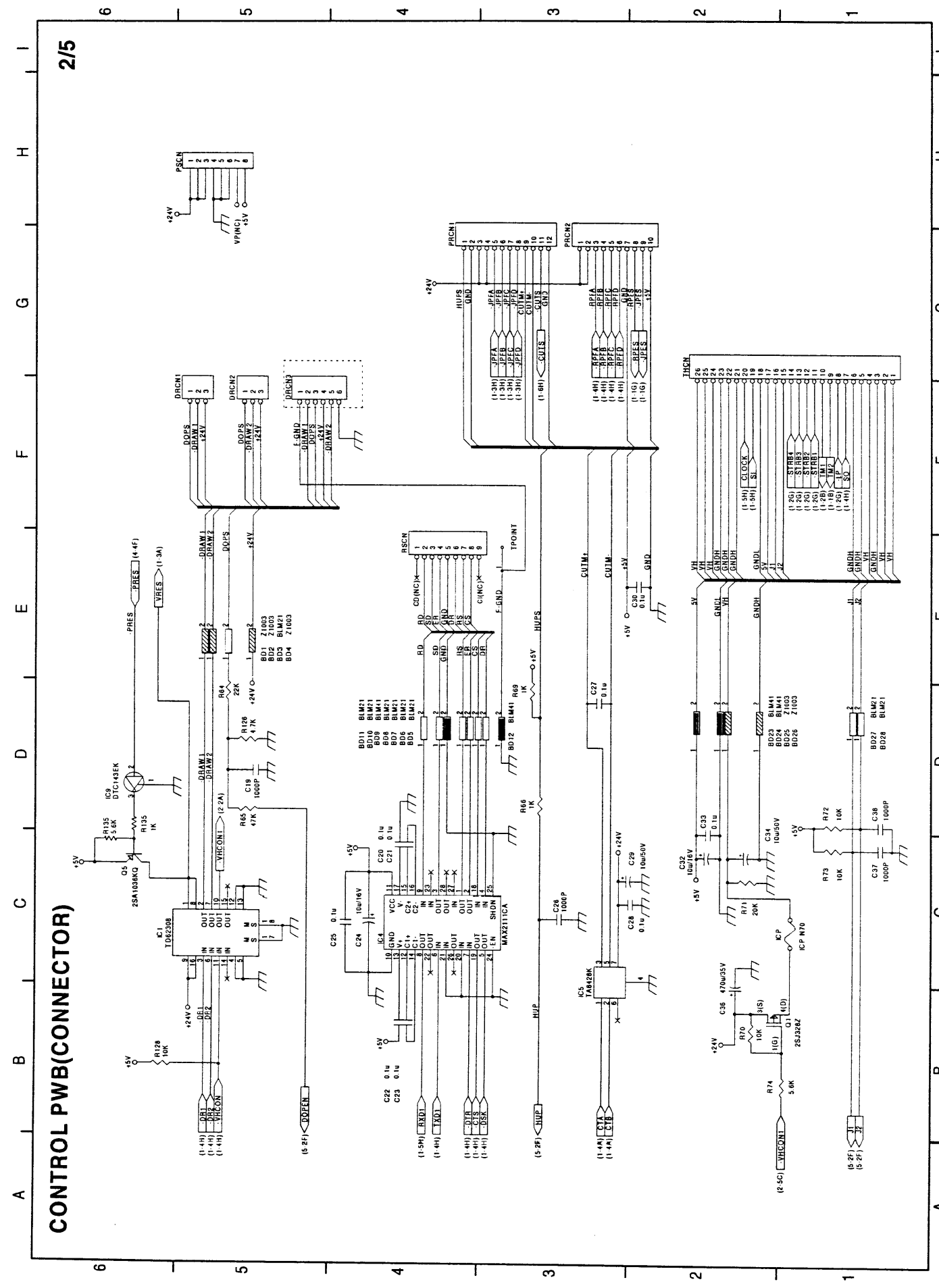
+24V: PRINTER UNIT, DRAWER DRIVE CIRCUIT

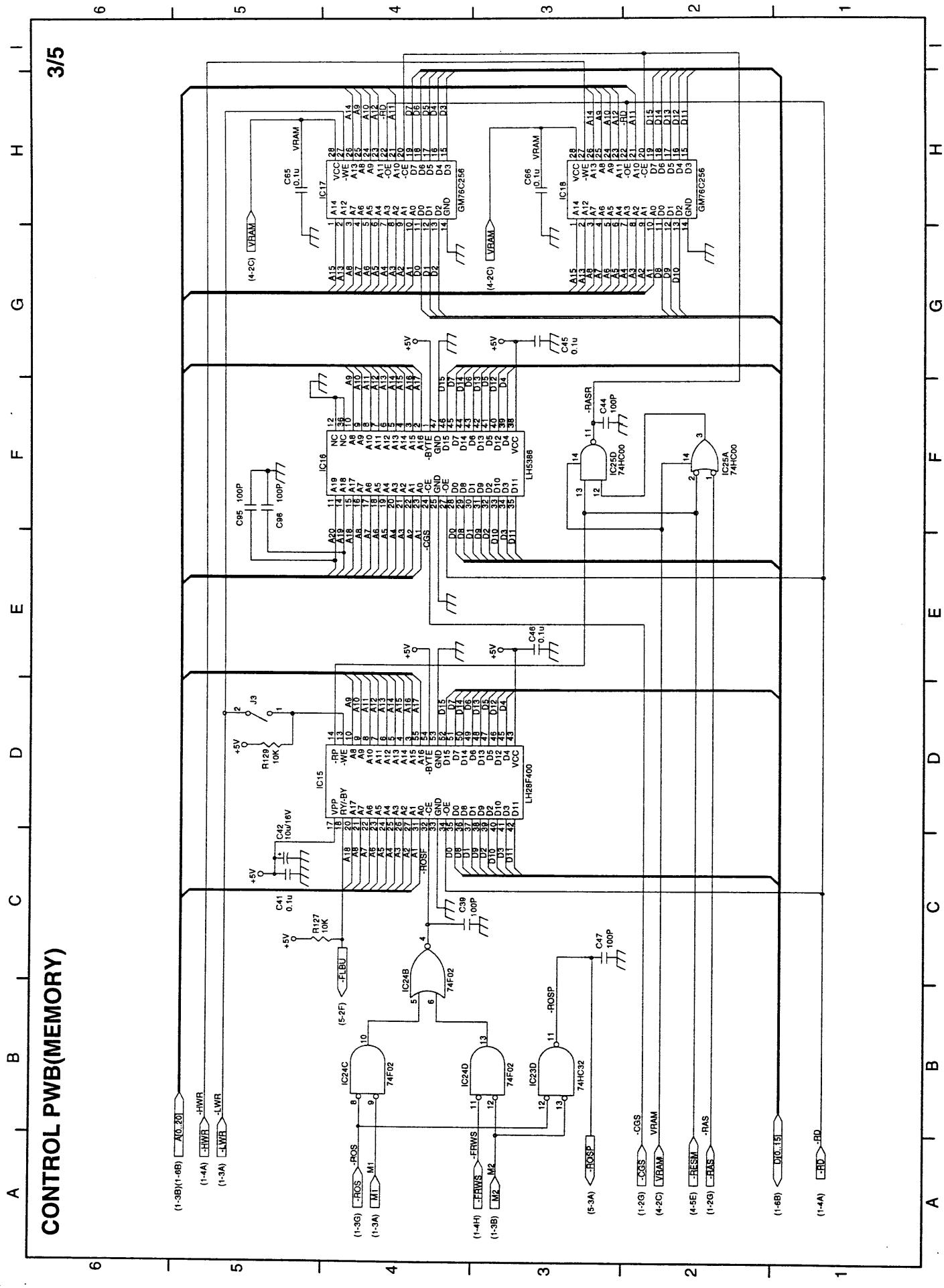
+ 5V: IC

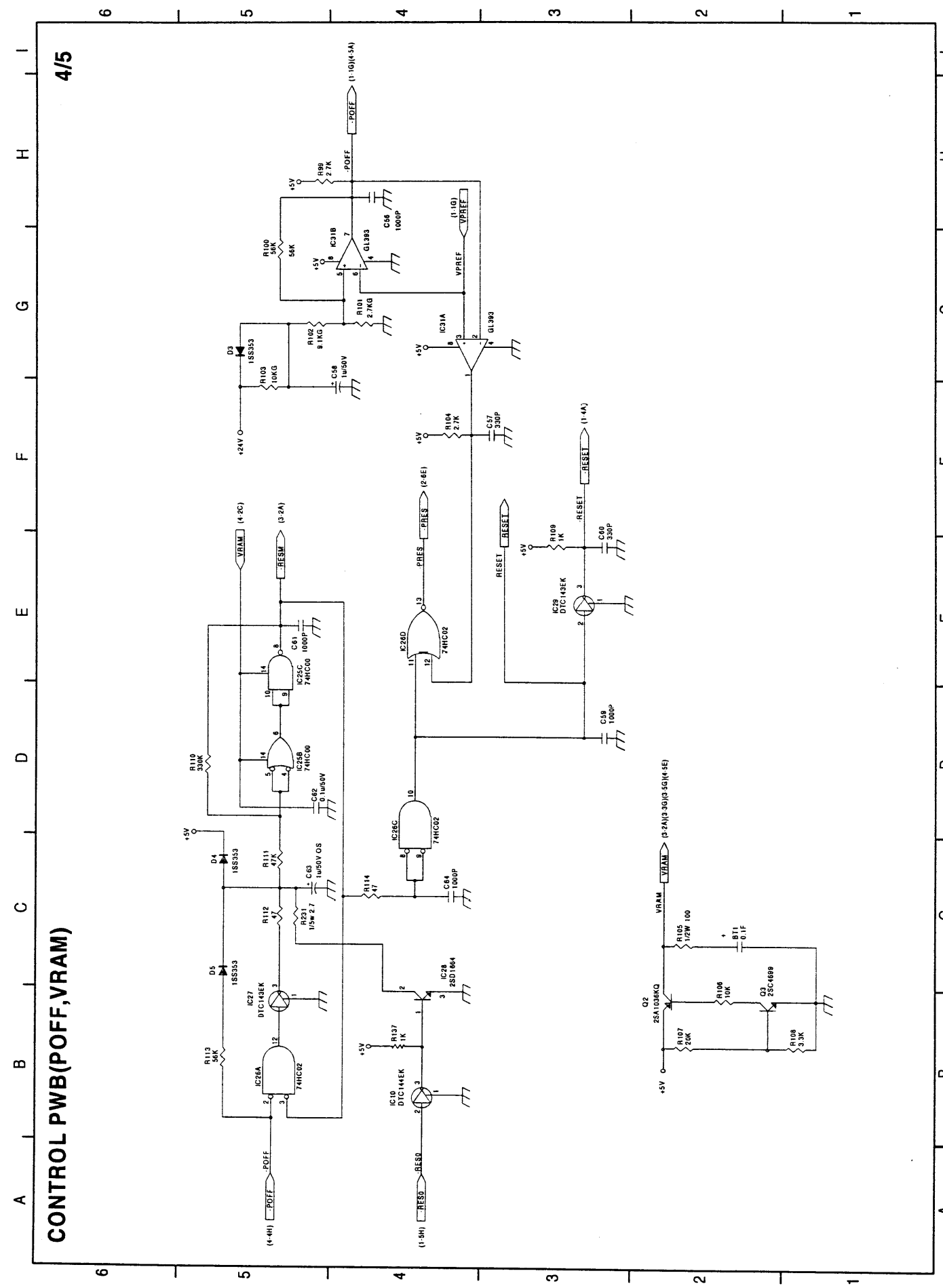
CHAPTER. 13 CIRCUIT DIAGRAM & PWB LAYOUT

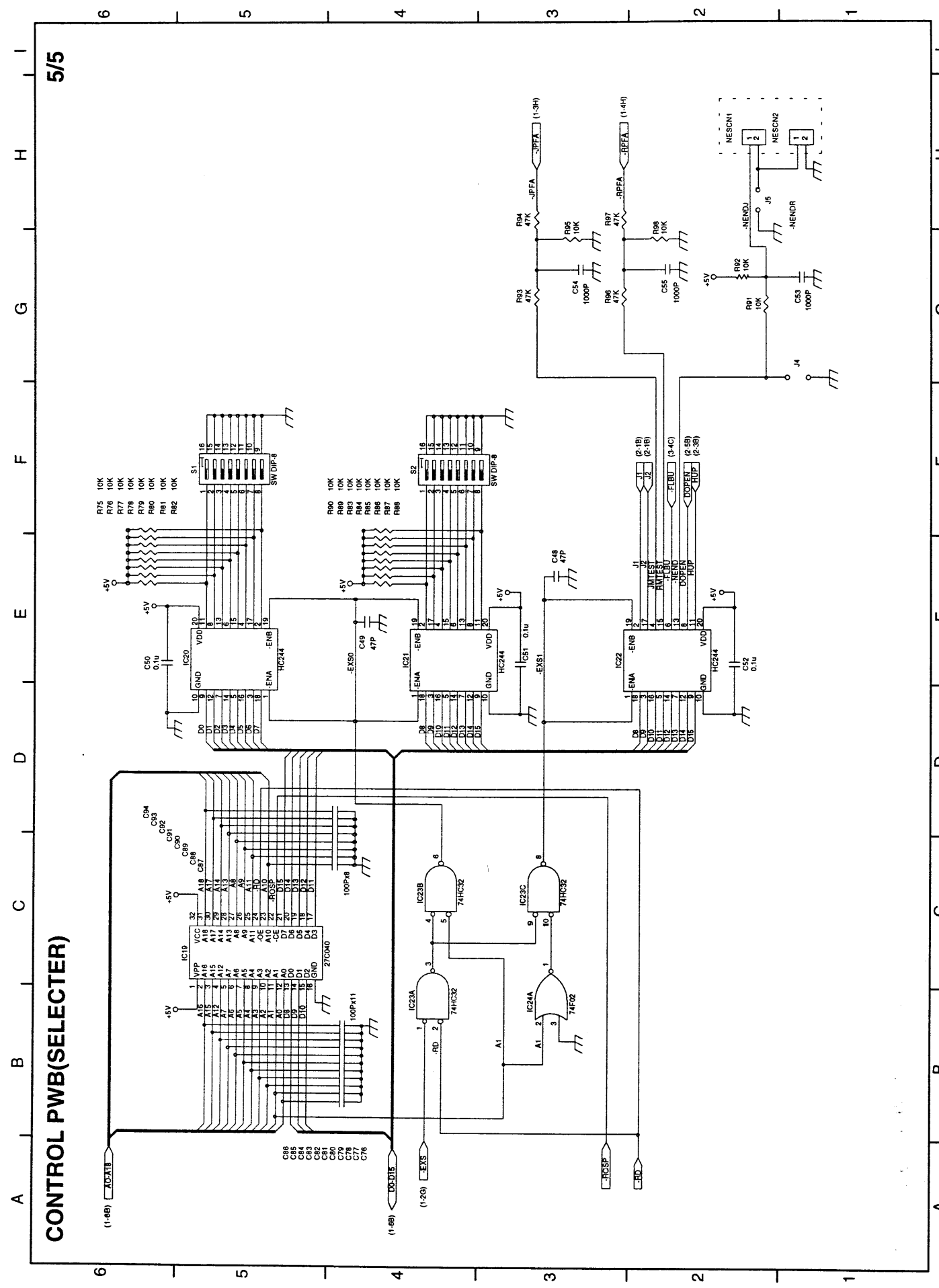
CONTROL PWB(CPU)




CONTROL PWB(CONNECTOR)
2/5

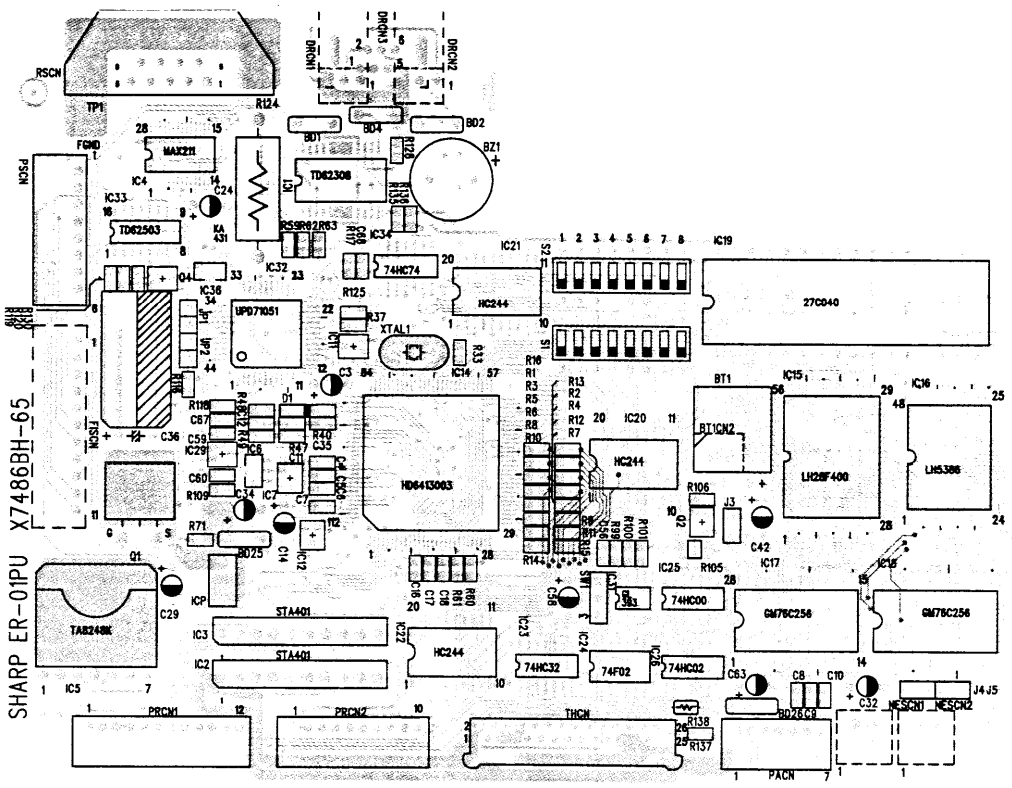

CONTROL PWB(MEMORY)
3/5
IC15
LH28F400
IC16
LH5386
IC17
IC18
GM76C256
IC23D
74HC32
IC24B
IC24C
IC24D
74F02
IC25A
IC25D
74HC00
J3
R127 10K
R129 10K
C41 0.1u
C42 10u/16V
C45 0.1u
C46 0.1u
C47 100P
C65 0.1u
C66 0.1u
C95 100P
C98 100P
+5V
VRAM
-FLBU
-ROS
M1
-FRWS
M2
-ROSP
-CGS
-RESM
-RAS
-RASR
-RD
-HWR
-LWR
A0..20
D0..15
(1-3B)(1-6B)
(1-4A)
(1-3A)
(1-3G)
(1-4H)
(5-2F)
(4-2C)
(5-3A)
(1-2G)
(4-5E)
(1-6B)


CONTROL PWB(POFF,VRAM)
4/5
POFF
VRAM
RESET
PRES
VPREF
RESO
+5V
+24V
IC31A
IC31B
GL393
IC26A
IC26B
IC26C
IC26D
IC25B
IC25C
74HC02
74HC00
IC27
IC28
IC29
IC10
DTC143EK
2SD1664
Q2
2SA1036KQ
Q3
2SC4699
D3
D4
D5
1SS353
R99 2.7K
R100 56K
R101 2.7KG
R102 8.1KG
R103 10KG
R104 2.7K
R105 1/2W 100
R106 10K
R107 20K
R108 3.3K
R109 1K
R110 330K
R111 47K
R112 4.7
R113 56K
R114 47
R137 1K
R231 1/5W 2.7
BT1 0.1F
C56 1000P
C57 330P
C58 1u/50V
C59 1000P
C60 330P
C61 1000P
C62 0.1u/50V
C63 1u/50V OS
C64 1000P

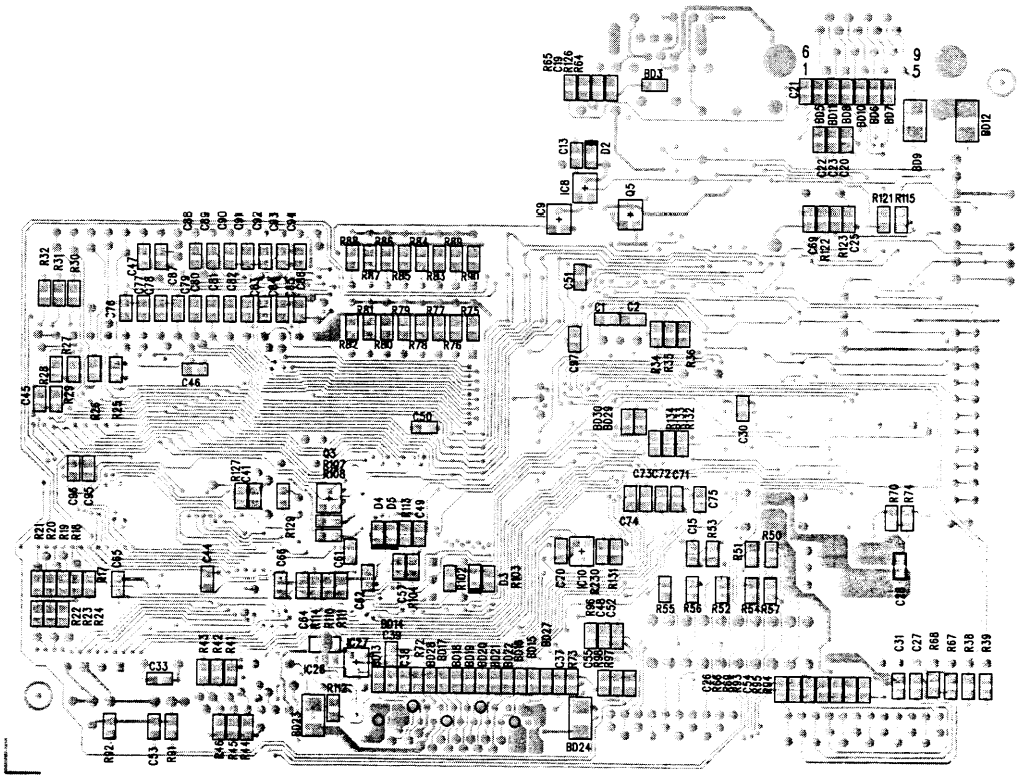

CONTROL PWB(SELECTER)
5/5
IC19
27C040
IC20
IC21
IC22
HC244
IC23A
IC23B
IC23C
74HC32
IC24A
74F02
S1
S2
SW DIP-8
J1
J2
J4
J5
NESCN1
NESCN2
-JPFA
-RPFA
-NENDJ
-NENDR
-FLBU
DOPEN
-HUP
-EXS0
-EXS1
-EXS
-RD
-ROSP
A1
A0-A18
D0-D15
100P x8
100P x11
+5V

1. Control PWB

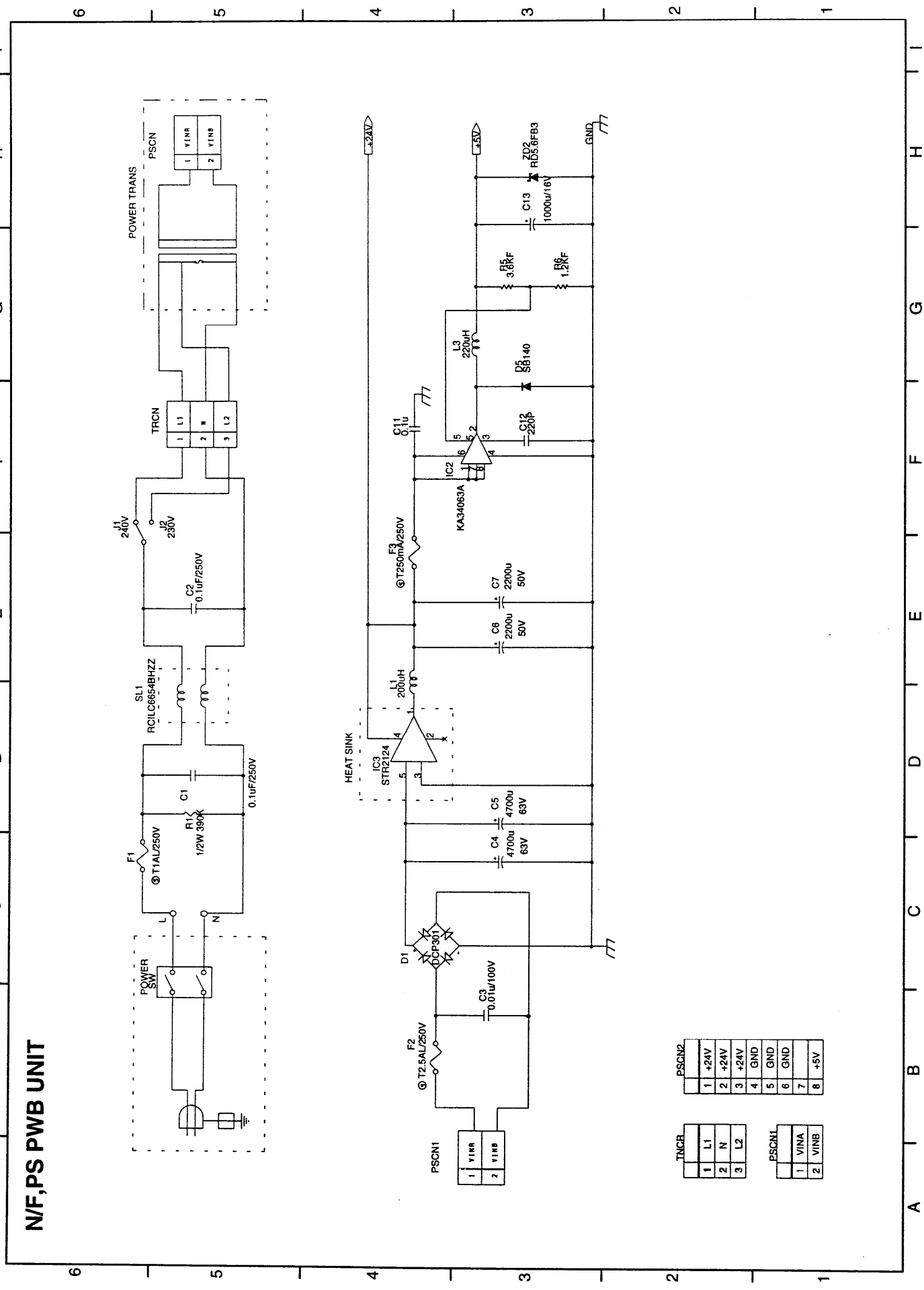
① A-side



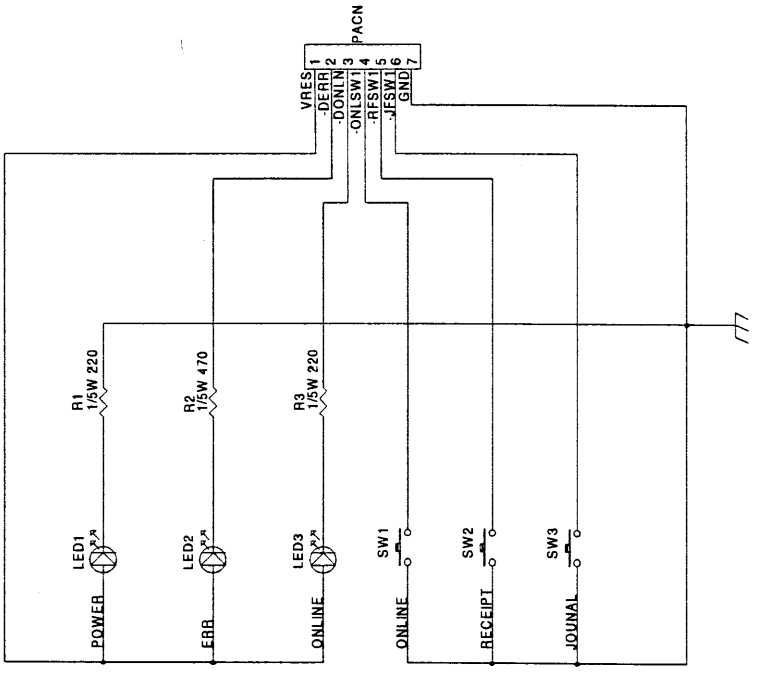
② B-side



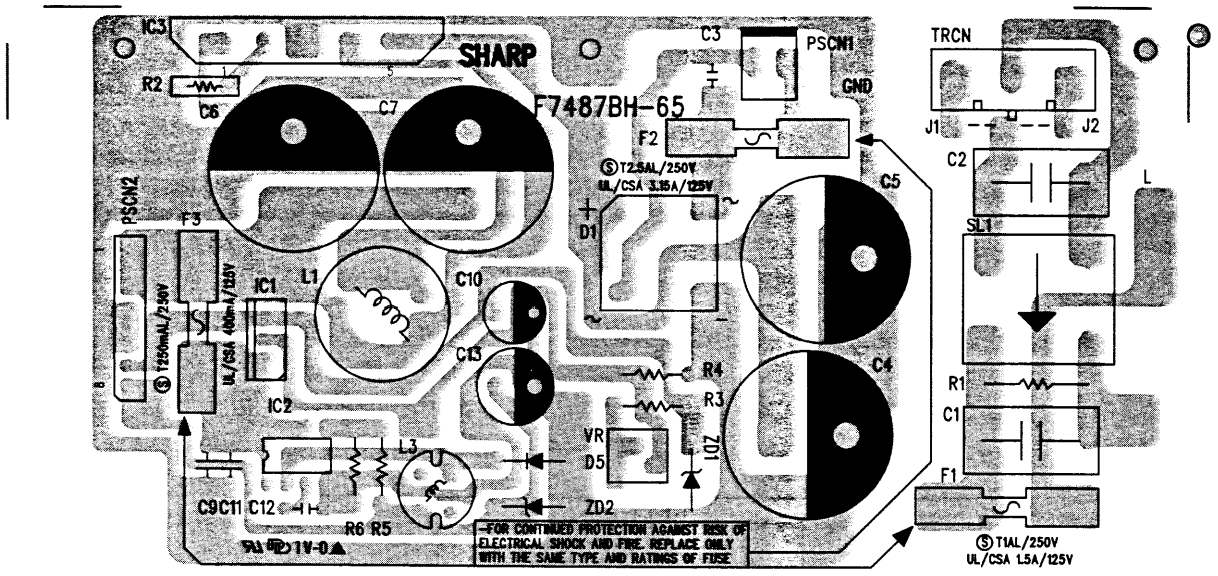
N/F,PS PWB UNIT



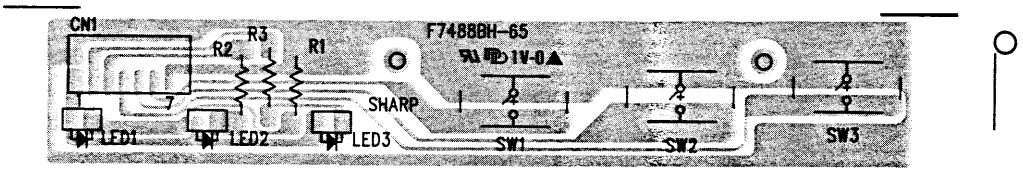
PANNEL PWB UNIT



2. Panel PWB



3. N/F PS PWB



SHARP PARTS GUIDE

MODEL ER-01PU

(for KA)

PRINTER: PR-58L

CONTENTS

1 Exterirs

2 Packing material&Accessories

3 Control PWB unit

4 N.F/PS PWB unit

5 Panel PWB unit

6 Aticles for consumption

7 Service route options

■ Index

Because parts marked with ⚠ is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U.S.A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp: English)
TR	SEEG territory other than Germany (Stamp: Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

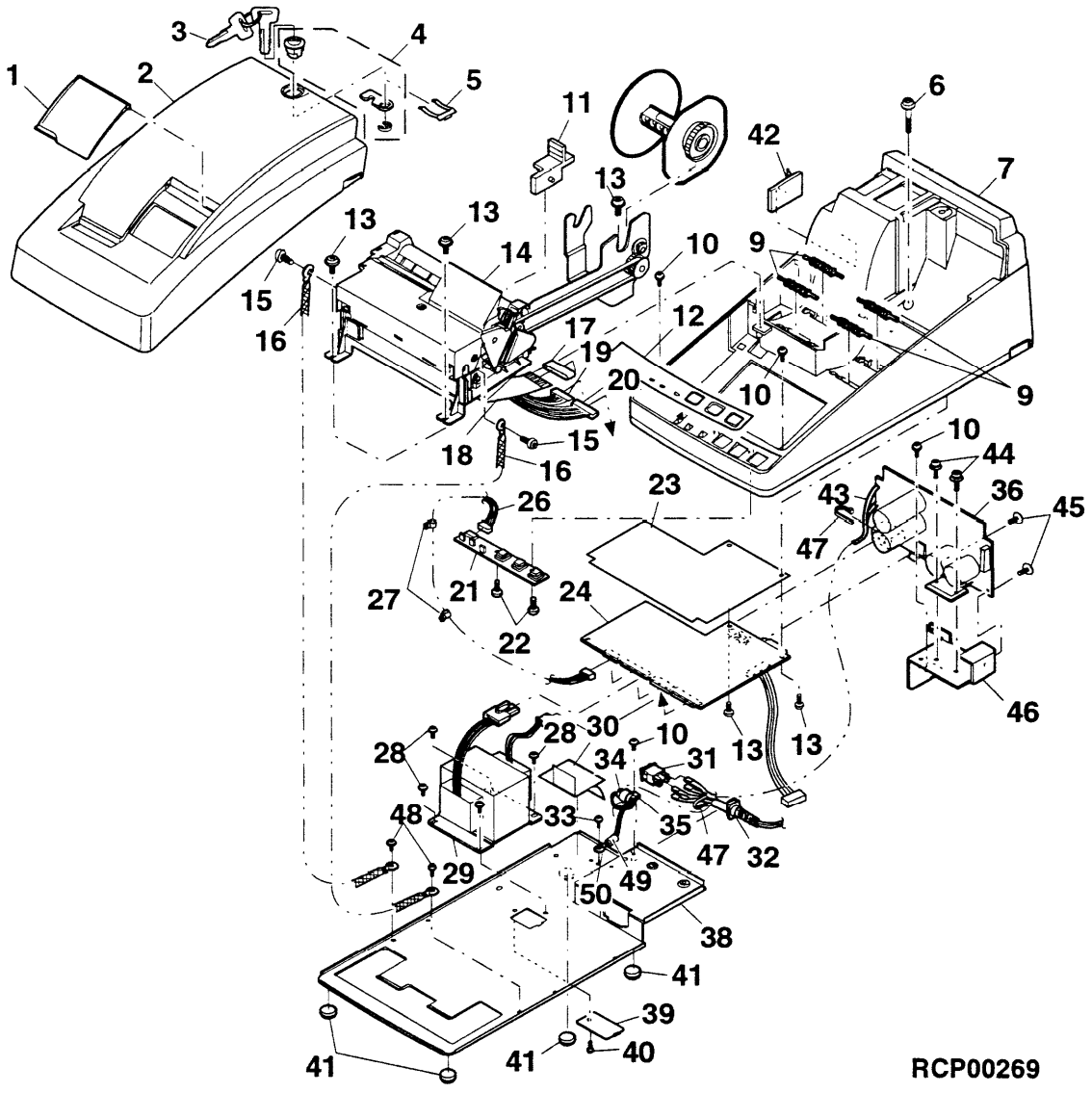
SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U.S.A.version)
SHE	South Africa (Europe version)
SJ	Phillippines (Europe version)
SJ2	Phillippines (U.S.A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

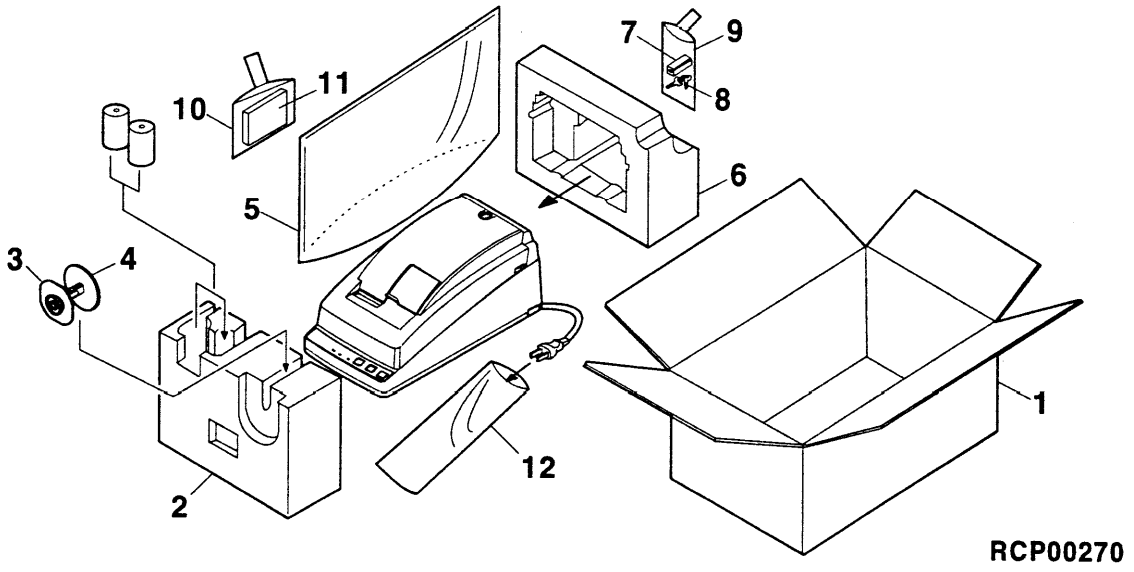
SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U.S.A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Exteriors



2 Packing material&Accessories



1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	PFiLW6959BHZZ	AL		C	Journal spring
2	GCÖVA7120BHZZ	AY		D	Printer cover
3	LKGiM7356BHZZ	AK		B	Printer cover lock key
4	LKGiW7355BHZZ	AX		B	Lock(body)
5	MSPRK6730BHZZ	AC		C	Lock spring
6	LX-BZ6755BHZZ	AB		C	Screw
7	GCABB7232BHZZ	BB		D	Top cabinet
9	NRÖLP6656BHZZ	AF		C	Roller
10	XBPSD30P08KS0	AA		C	Screw (M3 X 8KS)
11	MLEVP6715BHZZ	AF		C	Stopper
12	HDECP6845BHZZ	AN		D	Deco panel
13	LX-BZ1085CCZZ	AA		C	Screw (3 X 8)
14	Ki-ÖB6779BHZZ	CG		E	Printer unit (PR-58L)
15	XBPSD30P06K00	AA		C	Screw (M3 X 6K)
16	QCNW-7801BHZZ	AF		C	Printer earth wire
17	RCÖRF6686RCZZ	AN		C	Core (SSC33.5-20F)
18	QCNW-7783BHZZ	AQ		C	TP flat cable (26pin)
19	QCNW-7792BHZZ	AQ		C	Printer cable (10pin)
20	QCNW-7793BHZZ	AR		C	Printer cable (12pin)
21	CPWBF7488BH01	BA		E	Panel PWB unit
22	XEPSD30P08000	AA		C	Screw (3 X 8)
23	GCÖVH7121BHZZ	AS		D	Main PWB sheet
24	CPWBX7486BH01	CG		E	Control PWB unit
26	QCNW-7791BHZZ	AN		C	Panel cable (7pin)
27	LHLDW6821BHZZ	AD		C	Clamp
28	XBPSD40P08KS0	AA		C	Screw (M4 X 8KS)
⚠ 29	RTRNP6887BHZZ	BL		B	Power transformer
30	GCÖVH7122BHZZ	AT		D	AC sw sheet
31	QSW-C9212QCZZ	AH	N	B	Powe switch
⚠ 32	QACCL7421BHZZ	AX		B	AC cord (SP-500)
33	XBPBZ40P06K00	AA		C	Screw (M4 X 6K)
34	RCÖRF6703BHZZ	AG		C	Core (OP12 X 15)
35	LHLDW0007SCZZ	AA		C	Wire holder (HP-7N)
36	CPWBF7487BH01	BR		E	N.F/PS PWB unit [include No.44~46]
38	LPLTM6701BHZA	BC	N	C	Bottom plate
39	LANGH7601BHZZ	AK		C	SW angle
40	XHPSD30P06K00	AA		C	Screw (M3 X 6K)
41	PGUMM6729BHZZ	AF	N	C	Gum leg
42	PHÖG-6631BHZZ	AK		D	Cushion
43	QCNW-7799BHZZ	AH		C	N/F cable
44	XBPSD30P15KS0	AA		C	Screw (3 X 15KS)
45	XBPSD30P10KS0	AB		C	Screw (M3 X 10KS)
46	PRDAF6664BHZA	AR	N	C	Heat sink
47	LBNDJ2003SCZZ	AA		C	Cable band
48	LX-BZ6775BHZZ	AA		C	Screw
49	QTANP0004BHZA	AE		C	Earth terminal
50	QCNW-7819BHZZ	AF	N	C	Earth wire
501	DUNT-1817BHZZ	AY		E	Lock key unit [include No.3,5]

2 Packing material&Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC8347BHZZ	AW		D	Packing case
2	SPAKA8345BHZZ	AS		D	Packin add (F)
3	NGERH6642BHZZ	AR		D	Spool
4	PGiDH6718BHZZ	AH		D	P/G wheel
5	SSAKH0003DHZZ	AE		D	Vinyl bag (640 X 560mm) (for SET)
6	SPAKA8346BHZZ	AS		D	Packing add(R)
7	RCÖRF6700BHZZ	AS		C	Core
8	LKGiM7356BHZZ	AK		B	Printer cover lock key
9	SSAKH4231CCZZ	AA		D	Vinyl bag (140 X 500mm)
10	SSAKH3015CCZZ	AA		D	Vinyl bag (200 X 300mm)
11	TiNSM7354BHZZ	BA		D	Instruction book
12	SSAKH3012CCZZ	AA		D	Vinyl bag (80 X 120mm) (for AC cord)
101	UBNDA6629BHZZ	AA		C	AC cord band (4mm X 200mm)(Green)

3 Control PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	QCNCM1060AC03	AB		C	Connector (Short Pin 3P)	[SW1]
2	QCNCM2551RC0G	AE		C	Connector (5pin)	[PACN]
3	QCNCM2551RC1B	AE		C	Connector (12pin)	[PRCN1]
4	QCNCM2551RC1J	AF		C	Connector (10pin)	[PRCN2]
5	QCNCM7125BH0i	AN		C	Connector ((9P) MLX 87023-6066)	[RSCN]
6	QCNCW1057ACZZ	AB		C	Connector (Short socket)	[SW1]
7	QCNCW7195RC2F	AN		C	Connector (26pin)	[THCN]
8	QCNW-7790BHZZ	AP		C	PS cable	[PSCN]
9	QSOCZ2042SC32	AE		C	IC socket (32pin)	[IC19]
10	QSW-Z5017BCZZ	AN		B	Dip switch (DSS708)(8pin)	[S1,2]
11	RALMB6646BHZZ	AQ		B	Buzzer	[BZ1]
12	RC-DZ1041RC0L	AN		C	Capacitor (SCDA5R104H)	[BT1]
13	RC-EZ105ARC1C	AC		C	Capacitor (16WV 1μF)	[C63]
14	RCRSZ7008SCZZ	AD		B	Crystal (16MHz)	[XTAL1]
15	VCEAGU1VW477M	AD		C	Capacitor (35WV 470μF)	[C36]
16	VHi4AC16///-1	AK		B	IC (4AC16)	[IC2,3]
17	VHiTA8428K/-1	AN		B	IC (TA8428K)	[IC5]
18	VRD-RC2EY2R7J	AA		C	Resistor (1/4W 2.7Ω ±5%)	[R138]
20	RCORF1008ACZZ	AB		C	Chip bead (BUM21A05)	[BD3,5~8,10,11,13~22,27,28,29,30]
21	RCORF7002BHZZ	AE		C	Chip core (EFCB322513TS)	[BD9,12,23,24]
22	VHD1SS353//-1	AB		B	Diode (1SS353)	[D2,3,4,5]
23	VS2SA1036KQRC	AB		B	Transistor (2SA1036)	[Q5]
24	VS2SC4699KP-1	AC		B	Transistor (2SC4699KP)	[Q3]
25	VS2SD1664QR-1	AD		B	Transistor (2SD1664QR)	[IC28]
26	VSDTC143EK/-1	AB		B	Transistor (DTC143EK)	[IC8,9,27]
27	VSDTC144EK/-1	AC		B	Transistor (DTC144EK)	[IC10]
28	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000pF)	[C19,28,31,37,38,53,54,55,61,64]
29	VCCCTV1HH101J	AA		C	Capacitor (50WV 100pF)	[C39,44,47,76~96]
30	VCCCTV1HH150J	AA		C	Capacitor (50WV 15PF)	[C1,2]
31	VCCCTV1HH331J	AA		C	Capacitor (50WV 330pF)	[C57,70,71,72,73,74,75]
32	VCCCTV1HH470J	AA		C	Capacitor (50WV 47pF)	[C48,49,97]
33	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C13,15,20~23,25,27,28,30,33,41]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C45,46,50,51,52,62,65,66,69]
34	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R34,35,36]
35	VRS-TS2AD102J	AA		C	Resistor (1/10W 1.0KΩ ±5%)	[R41~46,66~69,115,121]
36	VRS-TS2AD103F	AA		C	Resistor (1/10W 10KΩ ±1%)	[R123]
37	VRS-TS2AD103G	AB		C	Resistor (1/10W 10KΩ ±2%)	[R103]
38	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R17~32,38,39,70,72,73,75~92,95]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R98,127,129,131,134,230,132,133]
39	VRS-TS2AD123F	AA		C	Resistor (1/10W 12KΩ ±1%)	[R122]
40	VRS-TS2AD203J	AA		C	Resistor (1/10W 20KΩ ±5%)	[R107]
41	VRS-TS2AD222J	AA		C	Resistor (1/10W 2.2KΩ ±5%)	[R50~57]
42	VRS-TS2AD223J	AA		C	Resistor (1/10W 22KΩ ±5%)	[R64]
43	VRS-TS2AD272J	AA		C	Resistor (1/10W 2.7KΩ ±5%)	[R104]
44	VRS-TS2AD332J	AA		C	Resistor (1/10W 3.3KΩ ±5%)	[R108]
45	VRS-TS2AD334J	AA		C	Resistor (1/10W 330KΩ ±5%)	[R110]
46	VRS-TS2AD470J	AA		C	Resistor (1/10W 47Ω ±5%)	[R112,114]
47	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R126]
48	VRS-TS2AD473J	AA		C	Resistor (1/10W 47KΩ ±5%)	[R65,93,94,96,97,111]
49	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R74]
50	VRS-TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%)	[R113]
51	VRS-TS2AD912G	AA		C	Resistor (1/10W 9.1KΩ ±2%)	[R102]
52	RCiLZ1003BHZZ	AF		C	Dip coil (BFW7550R2)	[BD1,2,4,25,26]
53	VCEAJA1CW106M	AB		C	Capacitor (16WV 10μF)	[C3,14,24,32,42]
54	VCEAJA1HW105M	AB		C	Capacitor (50WV 1.0μF)	[C58]
55	VCEAJA1VW106M	AB		C	Capacitor (35WV 10μF)	[C29,94]
56	VHViCPN70//-1	AF		B	IC protector (ICP-N70)	[ICP]
57	VHi6413003T16	BC		B	IC (6413003T16)	[IC14]
58	VHi74F02SJ/-1	AF		B	IC (74F02SJ)	[IC24]
59	VHiG76C256F70	BC		B	IC (G76C256F70)	[IC11,18]
60	VHiGD74HC244D	AN		B	IC (GD74HC244D)	[IC20,21,22]
61	VHiiR9393N/-1	AD		B	IC (IR9393N)	[IC31]
62	VHiLHF40SUTZ1	BE		B	IC (LHF40SUTZ1)	[IC51]
63	VHiMAX211CAi1	AW		B	IC (MAX211CAI)	[IC4]
64	VHiSN74HC00NS	AC		B	IC (SN74HC00NS)	[IC25]
65	VHiSN74HC02D1	AH		B	IC (SN74HC02DR)(VHISN74HC02DR)	[IC26]
66	VHiSN74HC32NS	AK		B	IC (SN74HC32NS)	[IC23]
67	VHiTD62308F-1	AH		B	IC (TD62308F)	[IC1]
68	VS2SJ328-Z/-1	AP		B	Transistor (2SJ328J)	[Q1]
69	VCCCTV1HH101J	AA		C	Capacitor (50WV 100pF)	[C35]
70	VCCCTV1HH331J	AA		C	Capacitor (50WV 330pF)	[C60]
71	VCCCTV1HH470J	AA		C	Capacitor (50WV 47pF)	[C4~7,16,17]
72	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000pF)	[C8~10,12,18,56,59]
73	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C11,67,68]
74	VHD1SS353//-1	AB		B	Diode (1SS353)	[D1]
75	VHiKiA431F/-1	AK		B	IC (KIA431F)	[IC6]
76	VS2SA1036KQRC	AB		B	Transistor (2SA1036)	[Q2,4]
77	VSDTC143EK/-1	AB		B	Transistor (DTC143EK)	[IC7,11,12,29]
78	VRD-RB2HY101J	AA		C	Resistor (1/2W 100Ω ±5%)	[R105]
79	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R1~16,117]

3 Control PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
80	VRS-TS2AD102J	AA		C	Resistor (1/10W 1.0KΩ ±5%)	[R37,109,125,136,137]
81	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R59,60,61,62,63,106,128,130]
82	VRS-TS2AD122J	AA		C	Resistor (1/10W 1.2KΩ ±5%)	[R120]
83	VRS-TS2AD163F	AA		C	Resistor (1/10W 16KΩ ±1%)	[R48]
84	VRS-TS2AD183G	AB		C	Resistor (1/10W 18KΩ ±2%)	[R40]
85	VRS-TS2AD203J	AA		C	Resistor (1/10W 20KΩ ±5%)	[R71]
86	VRS-TS2AD241J	AA		C	Resistor (1/10W 24Ω ±5%)	[R49]
87	VRS-TS2AD272G	AB		C	Resistor (1/10W 2.7Ω ±2%)	[R101]
88	VRS-TS2AD272J	AA		C	Resistor (1/10W 2.7KΩ ±5%)	[R99]
89	VRS-TS2AD332J	AA		C	Resistor (1/10W 3.3KΩ ±5%)	[R119]
90	VRS-TS2AD362F	AA		C	Resistor (1/10W 3.6KΩ ±1%)	[R47]
91	VRS-TS2AD470J	AA		C	Resistor (1/10W 47Ω ±5%)	[R33]
92	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R116]
93	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R118,135]
94	VRS-TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%)	[R100]
95	QCNCM2423RC0H	AD		C	Connector (8pin)	[PSCN]
	(Unit)					
901	CPWBX7486BH01	CG		E	Control PWB unit	

4 N.F/PS PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	PRDAF6664BHZA	AR	N	C	Heat sink	
2	QCNCM1101BHZZ	AC		C	PS connector (5273-02A)(2P)	[PSCN1]
3	QCNCW6865BH0H	AD	N	C	PS Connector (6267-08A)	[PSCN2]
4	QCNCW7199BH0E	AE		C	Connector (35328-0510)	[TRCN]
⚠ 5	QFS-C1028CCZZ	AE		A	Fuse (T250mA/250V)	[F3]
⚠ 6	QFS-C1322QCZZ	AE		A	Fuse (250V 1A)	[F1]
⚠ 7	QFS-C2521TAZZ	AE		A	Fuse (250V 2.5A)	[F2]
8	RC-DZ4781RC1J	AY		C	Capacitor (63WV 4700μF)	[C4,5]
9	RC-FZ1041RC2E	AE		C	Capacitor (250WV 0.1μF)	[C1,2]
10	RCiLC6647RCZZ	AE		C	Coil (RCH-110)	[L3]
11	RCiLC6652RCZZ	AK		C	Coil (24V)(MC182-201M)	[L1]
12	RCiLC6654BHZZ	AR		C	Coil	[SL1]
13	VCEA2U1HW228M	AH		C	Capacitor (50WV 2200μF)	[C6,7]
14	VCEAGU1CW108M	AD		C	Capacitor (16WV 1000μF)	[C13]
15	VHDCP301///-1	AL		B	Diode (CP301)	[BD1]
16	VHiKA34063A-1	AP		B	IC (KA34063A)	[IC2]
17	VHiSTR2124/-1	AR		B	IC (STR2124)	[IC3]
18	XBPSD30P10KS0	AB		C	Screw (M3 × 10KS)	[(for heat sink)]
19	XBPSD30P15KS0	AA		C	Screw (3 × 15KS)	
20	VHDSB140///-1	AF		B	Diode (SB140)	[D5]
21	VHERD5.6FB3-1	AC		B	Zener diode (RD5.6FB3)	[ZD2]
22	VRD-RB2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%)	[R1]
23	VRNRC2EK1201F	AA		C	Resistor (1/4W 1.2KΩ ±1%)	[R6]
24	VRNRC2EK3601F	AA		C	Resistor (1/4W 3.6Ω ±1%)	[R5]
25	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF)	[F1,2,3]
26	VCKYPU1HB221K	AB		C	Capacitor (50WV 220pF)	[C12]
27	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C11]
28	VCQYNA2AM103K	AA		C	Capacitor (100WV 0.10μF)	[C3]
29	QCNW-7790BHZZ	AP		C	PS cable	
30	LX-BZ6782BHZZ	AA		C	Screw (3 × 8KS)	
31	XNESD30-24000	AA		C	Nut (M3)	
32	XBPSD30P12KS0	AA		C	Screw (3 × 12KS)	[(IC3)]
	(Unit)					
901	CPWBF7487BH01	BR		E	N.F/PS PWB unit	

5 Panel PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	PCAPZ6641BHZZ	AE		C	Switch cap (JC0808A)	[SW1,2,3]
2	QCNCM2551RC0G	AE		C	Connector (7pin)	[CN]
3	QSW-P6905BHZZ	AG		B	Push switch (JTP1212FE)	[SW1,2,3]
4	VHPSB25MG//-1	AF		B	LED (SB25MG Green)	[LED1,3]
5	VHPSB25VR//-1	AF		B	LED (SB25VR Red)	[LED2]
6	VRD-RC2EY221J	AA		C	Resistor (1/4W 22Ω ±5%)	[R1,3]
7	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R2]
	(Unit)					
901	CPWBF7488BH01	BA		E	Panel PWB unit	

6 Aticles for consumptions

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	TPAPR6656RC05	BA		S	Roll paper (5pcs./pack 80)

7 Service route options&Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	DUNT-5800BHZZ	AZ		S	Near end sensor unit [include No.101-112]
2	QCNCM5278NCZZ	AC		S	Drawer connector
11	VHi27040RAY1B	BB		S	Master ROM
101	LANGK7599BHZZ	AN		C	Sensor angle
102	MLEVF6714BHZZ	AL		C	Sensor lever
103	QSW-M6887BHZZ	AV		B	END switch
104	XBPSD20P08000	AA		C	Screw (2 X 8)
105	MSPRC6753BHZZ	AD	N	C	lever spring
106	QCNW-7800BHZZ	AE		C	Micro sw cable
107	QCNCM2423BH02	AD		C	Connector (2pin)
108	XBPSD30P06KS0	AA		C	Screw (M3 X 6KS)
109	QCNW-7802BHZZ	AE	N	C	GND wire
110	GFTAT6923BHZZ	AK	N	D	Sensor cover
111	LANGT7608BHZZ	AZ	N	C	Angle-A
112	LANGT7609BHZZ	BB	N	C	Angle-B

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
〔C〕					
CPWBF7487BH01	1- 36	BR		E	
〃	4- 901	BR		E	
CPWBF7488BH01	1- 21	BA		E	
〃	5- 901	BA		E	
CPWBX7486BH01	1- 24	CG		E	
〃	3- 901	CG		E	
〔D〕					
DUNT-1817BHZZ	1- 501	AY		E	
DUNT-5800BHZZ	7- 1	AZ		S	
〔G〕					
GCABB7232BHZZ	1- 7	BB		D	
GCOVA7120BHZZ	1- 2	AY		D	
GCOVH7121BHZZ	1- 23	AS		D	
GCOVH7122BHZZ	1- 30	AT		D	
GFTAT6923BHZZ	7- 110	AK	N	D	
〔H〕					
HDECP6845BHZZ	1- 12	AN		D	
〔K〕					
Ki-OB6779BHZZ	1- 14	CG		E	
〔L〕					
LANGH7601BHZZ	1- 39	AK		C	
LANGK7599BHZZ	7- 101	AN		C	
LANGT7608BHZZ	7- 111	AZ	N	C	
LANGT7609BHZZ	7- 112	BB	N	C	
LBNDJ2003SCZZ	1- 47	AA		C	
LHLDW0007SCZZ	1- 35	AA		C	
LHLDW6821BHZZ	1- 27	AD		C	
LKGiM7356BHZZ	1- 3	AK		B	
〃	2- 8	AK		B	
LKGiW7355BHZZ	1- 4	AX		B	
LPLTM6701BHZA	1- 38	BC	N	C	
LX-BZ1085CCZZ	1- 13	AA		C	
LX-BZ6755BHZZ	1- 6	AB		C	
LX-BZ6775BHZZ	1- 48	AA		C	
LX-BZ6782BHZZ	4- 30	AA		C	
〔M〕					
MLEVF6714BHZZ	7- 102	AL		C	
MLEVP6715BHZZ	1- 11	AF		C	
MSPRC6753BHZZ	7- 105	AD	N	C	
MSPRK6730BHZZ	1- 5	AC		C	
〔N〕					
NGERH6642BHZZ	2- 3	AR		D	
NROLP6656BHZZ	1- 9	AF		C	
〔P〕					
PCAPZ6641BHZZ	5- 1	AE		C	
PFiLW6959BHZZ	1- 1	AL		C	
PGiDH6718BHZZ	2- 4	AH		D	
PGUMM6729BHZZ	1- 41	AF	N	C	
PHOG-6631BHZZ	1- 42	AK		D	
PRDAF6664BHZA	1- 46	AR	N	C	
〃	4- 1	AR	N	C	
〔Q〕					
QACCL7421BHZZ	1- 32	AX		B	
QCNCM1060AC03	3- 1	AB		C	
QCNCM1101BHZZ	4- 2	AC		C	
QCNCM2423BH02	7- 107	AD		C	
QCNCM2423RC0H	3- 95	AD		C	
QCNCM2551RC0G	3- 2	AE		C	
〃	5- 2	AE		C	
QCNCM2551RC1B	3- 3	AE		C	
QCNCM2551RC1J	3- 4	AF		C	
QCNCM5278NCZZ	7- 2	AC		S	
QCNCM7125BH0i	3- 5	AN		C	
QCNCW1057ACZZ	3- 6	AB		C	
QCNCW6865BH0H	4- 3	AD	N	C	
QCNCW7195RC2F	3- 7	AN		C	
QCNCW7199BH0E	4- 4	AE		C	
QCNW-7783BHZZ	1- 18	AQ		C	
QCNW-7790BHZZ	3- 8	AP		C	
〃	4- 29	AP		C	
QCNW-7791BHZZ	1- 26	AN		C	
QCNW-7792BHZZ	1- 19	AQ		C	
QCNW-7793BHZZ	1- 20	AR		C	
QCNW-7799BHZZ	1- 43	AH		C	
QCNW-7800BHZZ	7- 106	AE		C	
QCNW-7801BHZZ	1- 16	AF		C	
QCNW-7802BHZZ	7- 109	AE	N	C	
QCNW-7819BHZZ	1- 50	AF	N	C	
QFS-C1028CCZZ	4- 5	AE		A	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QFS-C1322QCZZ	4- 6	AE		A	
QFS-C2521TAZZ	4- 7	AE		A	
QFSHD2109AFZZ	4- 25	AC		C	
QSOCZ2042SC32	3- 9	AE		C	
QSW-C9212QCZZ	1- 31	AH	N	B	
QSW-M6887BHZZ	7- 103	AV		B	
QSW-P6905BHZZ	5- 3	AG		B	
QSW-Z5017BCZZ	3- 10	AN		B	
QTANP0004BHZA	1- 49	AE		C	
〔R〕					
RALMB6646BHZZ	3- 11	AQ		B	
RC-DZ1041RC0L	3- 12	AN		C	
RC-DZ4781RC1J	4- 8	AY		C	
RC-EZ105ARC1C	3- 13	AC		C	
RC-FZ1041RC2E	4- 9	AE		C	
RC-KZ1054CCZZ	4- 27	AB		C	
RCiLC6647RCZZ	4- 10	AE		C	
RCiLC6652RCZZ	4- 11	AK		C	
RCiLC6654BHZZ	4- 12	AR		C	
RCiLZ1003BHZZ	3- 52	AF		C	
RCORF1008ACZZ	3- 20	AB		C	
RCORF6686RCZZ	1- 17	AN		C	
RCORF6700BHZZ	2- 7	AS		C	
RCORF6703BHZZ	1- 34	AG		C	
RCORF7002BHZZ	3- 21	AE		C	
RCRSZ7008SCZZ	3- 14	AD		B	
RTRNP6887BHZZ	1- 29	BL		B	
〔S〕					
SPAKA8345BHZZ	2- 2	AS		D	
SPAKA8346BHZZ	2- 6	AS		D	
SPAKC8347BHZZ	2- 1	AW		D	
SSAKH0003DHZZ	2- 5	AE		D	
SSAKH3012CCZZ	2- 12	AA		D	
SSAKH3015CCZZ	2- 10	AA		D	
SSAKH4231CCZZ	2- 9	AA		D	
〔T〕					
TiNSM7354BHZZ	2- 11	BA		D	
TPAPR6656RC05	6- 1	BA		S	
〔U〕					
UBNDA6629BHZZ	2- 101	AA		C	
〔V〕					
VCCCTV1HH101J	3- 29	AA		C	
〃	3- 69	AA		C	
VCCCTV1HH150J	3- 30	AA		C	
VCCCTV1HH331J	3- 31	AA		C	
〃	3- 70	AA		C	
VCCCTV1HH470J	3- 32	AA		C	
〃	3- 71	AA		C	
VCEAGU1CW108M	4- 14	AD		C	
VCEAGU1VW477M	3- 15	AD		C	
VCEAJA1CW106M	3- 53	AB		C	
VCEAJA1HW105M	3- 54	AB		C	
VCEAJA1VW106M	3- 55	AB		C	
VCEA2U1HW228M	4- 13	AH		C	
VCKYPU1HB221K	4- 26	AB		C	
VCKYTV1HB102K	3- 28	AA		C	
〃	3- 72	AA		C	
VCKYTV1HF104Z	3- 33	AA		C	
〃	3- 73	AA		C	
VCQYNA2AM103K	4- 28	AA		C	
VHDCP301///-1	4- 15	AL		B	
VHDSB140///-1	4- 20	AF		B	
VHD1SS353//-1	3- 22	AB		B	
〃	3- 74	AB		B	
VHERD5.6FB3-1	4- 21	AC		B	
VHiGD74HC244D	3- 60	AN		B	
VHiG76C256F70	3- 59	BC		B	
VHiiR9393N/-1	3- 61	AD		B	
VHiKA34063A-1	4- 16	AP		B	
VHiKiA431F/-1	3- 75	AK		B	
VHiLHF40SUTZ1	3- 62	BE		B	
VHiMAX211CAi1	3- 63	AW		B	
VHiSN74HC00NS	3- 64	AC		B	
VHiSN74HC02D1	3- 65	AH		B	
VHiSN74HC32NS	3- 66	AK		B	
VHiSTR2124/-1	4- 17	AR		B	
VHiTA8428K/-1	3- 17	AN		B	
VHiTD62308F-1	3- 67	AH		B	
VHi27040RAY1B	7- 11	BB		S	
VHi4AC16///-1	3- 16	AK		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHi6413003T16	3- 57	BC		B	
VHi74F02SJ/-1	3- 58	AF		B	
VHPSB25MG//-1	5- 4	AF		B	
VHPSB25VR//-1	5- 5	AF		B	
VHViCPN70//-1	3- 56	AF		B	
VRD-RB2HY101J	3- 78	AA		C	
VRD-RB2HY394J	4- 22	AA		C	
VRD-RC2EY2R7J	3- 18	AA		C	
VRD-RC2EY221J	5- 6	AA		C	
VRD-RC2EY471J	5- 7	AA		C	
VRNRC2EK1201F	4- 23	AA		C	
VRNRC2EK3601F	4- 24	AA		C	
VRS-TS2AD101J	3- 34	AA		C	
〃	3- 79	AA		C	
VRS-TS2AD102J	3- 35	AA		C	
〃	3- 80	AA		C	
VRS-TS2AD103F	3- 36	AA		C	
VRS-TS2AD103G	3- 37	AB		C	
VRS-TS2AD103J	3- 38	AA		C	
〃	3- 81	AA		C	
VRS-TS2AD122J	3- 82	AA		C	
VRS-TS2AD123F	3- 39	AA		C	
VRS-TS2AD163F	3- 83	AA		C	
VRS-TS2AD183G	3- 84	AB		C	
VRS-TS2AD203J	3- 40	AA		C	
〃	3- 85	AA		C	
VRS-TS2AD222J	3- 41	AA		C	
VRS-TS2AD223J	3- 42	AA		C	
VRS-TS2AD241J	3- 86	AA		C	
VRS-TS2AD272G	3- 87	AB		C	
VRS-TS2AD272J	3- 43	AA		C	
〃	3- 88	AA		C	
VRS-TS2AD332J	3- 44	AA		C	
〃	3- 89	AA		C	
VRS-TS2AD334J	3- 45	AA		C	
VRS-TS2AD362F	3- 90	AA		C	
VRS-TS2AD470J	3- 46	AA		C	
〃	3- 91	AA		C	
VRS-TS2AD472J	3- 47	AA		C	
〃	3- 92	AA		C	
VRS-TS2AD473J	3- 48	AA		C	
VRS-TS2AD562J	3- 49	AA		C	
〃	3- 93	AA		C	
VRS-TS2AD563J	3- 50	AA		C	
〃	3- 94	AA		C	
VRS-TS2AD912G	3- 51	AA		C	
VSDTC143EK/-1	3- 26	AB		B	
〃	3- 77	AB		B	
VSDTC144EK/-1	3- 27	AC		B	
VS2SA1036KQRC	3- 23	AB		B	
〃	3- 76	AB		B	
VS2SC4699KP-1	3- 24	AC		B	
VS2SD1664QR-1	3- 25	AD		B	
VS2SJ328-Z/-1	3- 68	AP		B	
【X】					
XBPBZ40P06K00	1- 33	AA		C	
XBPSD20P08000	7- 104	AA		C	
XBPSD30P06KS0	7- 108	AA		C	
XBPSD30P06K00	1- 15	AA		C	
XBPSD30P08KS0	1- 10	AA		C	
XBPSD30P10KS0	1- 45	AB		C	
〃	4- 18	AB		C	
XBPSD30P12KS0	4- 32	AA		C	
XBPSD30P15KS0	1- 44	AA		C	
〃	4- 19	AA		C	
XBPSD40P08KS0	1- 28	AA		C	
XEPSD30P08000	1- 22	AA		C	
XHPSD30P06K00	1- 40	AA		C	
XNESD30-24000	4- 31	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	

[redacted]
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